



# DLR Group

Architecture

Engineering

Planning

Interiors

## **Lee's Summit Middle School #4**

**Lee's Summit R-7 School District**

**Lee's Summit, Missouri**

## **Package 3 – Building & Site Permit Set**

Volume 1 of 4 – Division 00 through Division 07

**DLR Group Project No. 13-20102-00**

October 8, 2020

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I hereby certify that this specification was prepared by me or under my direct supervision  
and that I am a duly Licensed Architect under the laws of the State of Missouri.



Scott Pashia

License No. 7347

I hereby certify that this specification was prepared by me or under my direct supervision  
and that I am a duly Licensed Professional Engineer under the laws of the State of Missouri.



Derek Joseph Smith

License No. 2007012527

I hereby certify that this specification was prepared by me or under my direct supervision  
and that I am a duly Licensed Professional Engineer under the laws of the State of Missouri.



Carl J. Holden

License No. 2020016283

Oct 7 2020

I hereby certify that this specification was prepared by me or under my direct supervision  
and that I am a duly Licensed Professional Engineer under the laws of the State of Missouri.



Christopher J. Culp License No. 2013037646

Oct 7 2020

I hereby certify that this specification was prepared by me or under my direct supervision  
and that I am a duly Licensed Professional Engineer under the laws of the State of Missouri.



Curtis A. Olds License No. 2018036640

Oct 7 2020

I hereby certify that this specification was prepared by me or under my direct supervision  
and that I am a duly Licensed Landscape Architect under the laws of the State of Missouri.



David H. Contag

License No. 000148

END OF SECTION 000105

DOCUMENT 000115 - LIST OF DRAWING SHEETS

1.1 LIST OF DRAWINGS

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| Sheet A12.6  | Interior Elevations                               |
| Sheet A13.0  | Interior Schedules                                |
| Sheet A13.1A | First Level Finish Floor Plan Area A              |
| Sheet A13.1B | First Level Finish Floor Plan Area B              |
| Sheet A13.1C | First Level Finish Floor Plan Area C              |
| Sheet A13.1D | First Level Finish Floor Plan Area D              |
| Sheet A13.1E | First Level Finish Floor Plan Area E              |
| Sheet A13.1F | First Level Finish Floor Plan Area F              |
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| Sheet A13.2A | Second Level Finish Floor Plan Area A             |
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| Sheet A13.2C | Second Level Finish Floor Plan Area C & D         |
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| Sheet A13.3  | Signage Schedule and Details                      |
| Sheet A13.4  | Signage Types                                     |

5. Food Service:

LIST OF DRAWING SHEETS

000115 - 4

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| Sheet FS101   | Food Service Special Conditions Plan  |
| Sheet FS102   | Food Service Elevations               |
| Sheet FS102.1 | Food Service Elevations               |
| Sheet FS102.2 | Food Service Elevations               |
| Sheet FS103   | Food Service Details                  |
| Sheet FS104   | Food Service Exhaust Hood             |
| Sheet FS104.1 | Food Service Exhaust Hood             |
| Sheet FS104.2 | Food Service Exhaust Hood             |
| Sheet FS104.3 | Food Service Exhaust Hood             |
| Sheet FS104.4 | Food Service Exhaust Hood             |
| Sheet FS104.5 | Food Service Exhaust Hood             |
| Sheet FS105   | Food Service Walk-in                  |
| Sheet FS105.1 | Food Service Walk-in                  |
| Sheet FS106   | Food Service Plumbing Rough-in Plan   |
| Sheet FS106.1 | Food Service Plumbing Schedule        |
| Sheet FS107   | Food Service Electrical Rough-in Plan |
| Sheet FS107.1 | Food Service Electrical Schedule      |
| Sheet FS108   | Food Service Mechanical Rough-in Plan |

6. Structural:

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| Sheet S0.1  | Structural Notes                       |
| Sheet S0.2  | Structural Notes                       |
| Sheet S0.3  | Snow Drift Plan                        |
| Sheet S0.4  | Storm Shelter Structural Criteria      |
| Sheet S0.5  | Grid Geometry Plan                     |
| Sheet S1.1D | Foundation Plan Area D                 |
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| Sheet S1.1S | Foundation Plan Areas S & T            |
| Sheet S2.1D | Low Roof Framing Plan Area D           |
| Sheet S2.1E | Floor and Low Roof Framing Plan Area E |
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| Sheet S2.2D | Roof Framing Plan Area D               |
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| Sheet S3.1  | Foundation Typical Details             |
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| Sheet S3.5  | Foundation Sections                    |
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| Sheet S4.8 | Masonry Typical Details      |
| Sheet S4.9 | Precast Typical Details      |
| Sheet S5.1 | Roof Framing Typical Details |
| Sheet S5.5 | Roof Framing Sections        |
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| Sheet S5.8 | Roof Framing Sections        |
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1. General – Volume 2:

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| Sheet 0.2 | Cover Sheet – Volume 2 |
|-----------|------------------------|

2. Mechanical:

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| Sheet M1.1B | HVAC First Level Plan Area B        |
| Sheet M1.1C | HVAC First Level Plan Area C        |
| Sheet M1.1D | HVAC First Level Plan Area D        |
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| Sheet M1.2C | HVAC Second Level Plan Area C       |
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| Sheet M2.2C | Piping Second Level Plan Area C     |
| Sheet M2.2D | Piping Second Level Plan Area D     |
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| Sheet M2.2G | Piping Second Level Plan Area G     |
| Sheet M5.1  | Mechanical Details                  |
| Sheet M5.2  | Mechanical Details                  |



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|--------------|--|
| Sheet M5.3   | Mechanical Details                       |
| Sheet M6.1   | Mechanical Schedules                     |
| Sheet M6.2   | Mechanical Schedules                     |
| Sheet M6.3   | Mechanical Schedules                     |
| Sheet M8.1   | Mechanical Controls                      |
| Sheet M8.2   | Mechanical Controls                      |
| Sheet M8.3   | Mechanical Controls                      |
| Sheet M8.4   | Mechanical Controls                      |
| Sheet M8.5   | Mechanical Controls                      |
| Sheet M8.6   | Mechanical Controls                      |
| Sheet M8.7   | Mechanical Controls                      |
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| Sheet MP1.3B | Mechanical and Plumbing Roof Plan Area B |
| Sheet MP1.3C | Mechanical and Plumbing Roof Plan Area C |
| Sheet MP1.3D | Mechanical and Plumbing Roof Plan Area D |
| Sheet MP1.3E | Mechanical and Plumbing Roof Plan Area E |
| Sheet MP1.3G | Mechanical and Plumbing Roof Plan Area G |

3. Plumbing:

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|-------------|-----------------------------------|
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| Sheet P1.1A | Plumbing First Level Plan Area A  |
| Sheet P1.1B | Plumbing First Level Plan Area B  |
| Sheet P1.1C | Plumbing First Level Plan Area C  |
| Sheet P1.1D | Plumbing First Level Plan Area D  |
| Sheet P1.1E | Plumbing First Level Plan Area E  |
| Sheet P1.1F | Plumbing First Level Plan Area F  |
| Sheet P1.1G | Plumbing First Level Plan Area G  |
| Sheet P1.2A | Plumbing Second Level Plan Area A |
| Sheet P1.2B | Plumbing Second Level Plan Area B |
| Sheet P1.2C | Plumbing Second Level Plan Area C |
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| Sheet P4.1  | Plumbing Enlarged Plans           |
| Sheet P4.2  | Plumbing Enlarged Plans           |
| Sheet P4.3  | Plumbing Enlarged Plans           |
| Sheet P4.4  | Plumbing Enlarged Plans           |
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| Sheet P4.6  | Plumbing Enlarged Plans           |
| Sheet P4.7  | Plumbing Enlarged Plans           |
| Sheet P4.8  | Plumbing Enlarged Plans           |
| Sheet P4.10 | Plumbing Enlarged Plans           |
| Sheet P4.11 | Plumbing Enlarged Plans           |
| Sheet P5.1  | Plumbing Details                  |
| Sheet P5.2  | Plumbing Details                  |
| Sheet P5.3  | Plumbing Details                  |
| Sheet P6.1  | Plumbing Schedules                |
| Sheet P8.1  | Plumbing Riser Diagrams           |

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| Sheet P8.2 | Plumbing Riser Diagrams |
| Sheet P8.3 | Plumbing Riser Diagrams |
| Sheet P8.4 | Plumbing Riser Diagrams |
| Sheet P8.6 | Plumbing Riser Diagrams |

4. Fire Protection:

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| Sheet FP0.1  | Fire Protection General Notes and Legend |
| Sheet FP1.1A | Fire Protection First Level RCP Area A   |
| Sheet FP1.1B | Fire Protection First Level RCP Area B   |
| Sheet FP1.1C | Fire Protection First Level RCP Area C   |
| Sheet FP1.1D | Fire Protection First Level RCP Area D   |
| Sheet FP1.1E | Fire Protection First Level RCP Area E   |
| Sheet FP1.1F | Fire Protection First Level RCP Area F   |
| Sheet FP1.1G | Fire Protection First Level RCP Area G   |
| Sheet FP1.2A | Fire Protection Second Level RCP Area A  |
| Sheet FP1.2B | Fire Protection Second Level RCP Area B  |
| Sheet FP1.2C | Fire Protection Second Level RCP Area C  |
| Sheet FP1.2D | Fire Protection Second Level RCP Area D  |
| Sheet FP1.2E | Fire Protection Second Level RCP Area E  |
| Sheet FP1.2F | Fire Sprinkler First Level RCP Area F    |
| Sheet FP1.2G | Fire Sprinkler First Level RCP Area G    |
| Sheet FP5.1  | Fire Protection Details                  |

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| Sheet E0.1   | Electrical General Notes and Legend      |
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| Sheet E1.01  | Electrical Site Plan Area 1              |
| Sheet E1.02  | Electrical Site Plan Area 2              |
| Sheet E1.03  | Electrical Site Plan Area 3              |
| Sheet E1.1A  | Lighting First Level RCP Area A          |
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| Sheet E1.1C  | Lighting First Level RCP Area C          |
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| Sheet E1.1E  | Lighting First Level RCP Area E          |
| Sheet E1.1F  | Lighting First Level RCP Area F          |
| Sheet E1.1G  | Lighting First Level RCP Area G          |
| Sheet E1.1ST | Electrical First Level Plans Areas S & T |
| Sheet E1.2A  | Lighting Second Level RCP Area A         |
| Sheet E1.2B  | Lighting Second Level RCP Area B         |
| Sheet E1.2C  | Lighting Second Level RCP Area C         |
| Sheet E1.2D  | Lighting Second Level RCP Area D         |
| Sheet E1.2E  | Lighting Second Level RCP Area E         |
| Sheet E1.2F  | Lighting Second Level RCP Area F         |
| Sheet E1.2G  | Lighting Second Level RCP Area G         |
| Sheet E2.1A  | Power Level First Level Plan Area A      |
| Sheet E2.1B  | Power Level First Level Plan Area B      |
| Sheet E2.1C  | Power Level First Level Plan Area C      |

|             |   |
|-------------|---|
| Sheet E2.1D | Power Level First Level Plan Area D           |
| Sheet E2.1E | Power Level First Level Plan Area E           |
| Sheet E2.1F | Power Level First Level Plan Area F           |
| Sheet E2.1G | Power Level First Level Plan Area G           |
| Sheet E2.2A | Power Level Second Level Plan Area A          |
| Sheet E2.2B | Power Level Second Level Plan Area B          |
| Sheet E2.2C | Power Level Second Level Plan Area C          |
| Sheet E2.2D | Power Level Second Level Plan Area D          |
| Sheet E2.2E | Power Level Second Level Plan Area E          |
| Sheet E2.2F | Power Level Second Level Plan Area F          |
| Sheet E2.2G | Power Level Second Level Plan Area G          |
| Sheet E3.1A | Equipment Connection First Level Plan Area A  |
| Sheet E3.1B | Equipment Connection First Level Plan Area B  |
| Sheet E3.1C | Equipment Connection First Level Plan Area C  |
| Sheet E3.1D | Equipment Connection First Level Plan Area D  |
| Sheet E3.1E | Equipment Connection First Level Plan Area E  |
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| Sheet E3.2C | Equipment Connection Second Level Plan Area C |
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| Sheet E3.3A | Equipment Connection Roof Plan Area A         |
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| Sheet E3.3E | Equipment Connection Roof Plan Area E         |
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| Sheet E4.0  | Enlarged Plans Electrical Rooms               |
| Sheet E4.1  | Kitchen Enlarged Power Plan                   |
| Sheet E4.2  | Electrical Dugout Plans                       |
| Sheet E5.1  | Electrical Details                            |
| Sheet E5.2  | Electrical Details                            |
| Sheet E6.1  | Electrical Schedules                          |
| Sheet E6.2  | Electrical Schedules                          |
| Sheet E6.3  | Electrical Schedules                          |
| Sheet E6.4  | Electrical Schedules                          |
| Sheet E6.5  | Electrical Schedules                          |
| Sheet E6.6  | Electrical Schedules                          |
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| Sheet E6.8  | Electrical Schedules                          |
| Sheet E6.9  | Electrical Schedules                          |
| Sheet E6.10 | Electrical Schedules                          |
| Sheet E6.11 | Electrical Schedules                          |
| Sheet E6.12 | Electrical Schedules                          |
| Sheet E6.13 | Electrical Schedules                          |
| Sheet E7.1  | Light Fixture Schedules                       |
| Sheet E7.2  | Light Fixture Schedules                       |
| Sheet E7.3  | Lighting Control Schedules                    |

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| Sheet E8.1  | Electrical One-Line Diagram |
| Sheet E8.1C | Electrical One-Line Diagram |
| Sheet E8.2  | Electrical One-Line Diagram |

6. Special Systems:

|              |                                      |
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| Sheet TA0.1  | Audio-Video General Notes & Legend   |
| Sheet TA0.2  | Audio-Video General Details Plates   |
| Sheet TA1.1A | Audio-Video First Level Plan Area A  |
| Sheet TA1.1B | Audio-Video First Level Plan Area B  |
| Sheet TA1.1C | Audio-Video First Level Plan Area C  |
| Sheet TA1.1D | Audio-Video First Level Plan Area D  |
| Sheet TA1.1E | Audio-Video First Level Plan Area E  |
| Sheet TA1.1F | Audio-Video First Level Plan Area F  |
| Sheet TA1.2A | Audio-Video Second Level Plan Area A |
| Sheet TA1.2B | Audio-Video Second Level Plan Area B |
| Sheet TA1.2C | Audio-Video Second Level Plan Area C |
| Sheet TA2.1D | Audio-Video First Level RCP Area D   |
| Sheet TA2.2D | Audio-Video Second Level RCP Area D  |
| Sheet TA2.2F | Audio-Video Second Level RCP Area F  |
| Sheet TA5.1  | Audio-Video Details                  |
| Sheet TA6.1  | Audio-Video Schedules                |
| Sheet TA7.1  | Audio-Video Signal Flows             |
| Sheet TA7.2  | Audio-Video Signal Flows             |
| Sheet TA7.3  | Audio-Video Signal Flows             |
| Sheet TN0.1  | Technology General Notes and Legend  |
| Sheet TN1.1A | Technology First Level Plan Area A   |
| Sheet TN1.1B | Technology First Level Plan Area B   |
| Sheet TN1.1C | Technology First Level Plan Area C   |
| Sheet TN1.1D | Technology First Level Plan Area D   |
| Sheet TN1.1E | Technology First Level Plan Area E   |
| Sheet TN1.1F | Technology First Level Plan Area F   |
| Sheet TN1.1G | Technology First Level Plan Area G   |
| Sheet TN1.1S | Technology First Level Plan Area S   |
| Sheet TN1.2A | Technology Second Level Plan Area A  |
| Sheet TN1.2B | Technology Second Level Plan Area B  |
| Sheet TN1.2C | Technology Second Level Plan Area C  |
| Sheet TN1.2E | Technology Second Level Plan Area E  |
| Sheet TN1.2F | Technology Second Level Plan Area F  |
| Sheet TN1.2G | Technology Second Level Plan Area G  |
| Sheet TN2.1A | Technology First Level RCP Area A    |
| Sheet TN2.1B | Technology First Level RCP Area B    |
| Sheet TN2.1C | Technology First Level RCP Area C    |
| Sheet TN2.1D | Technology First Level RCP Area D    |
| Sheet TN2.1E | Technology First Level RCP Area E    |
| Sheet TN2.1F | Technology First Level RCP Area F    |
| Sheet TN2.1G | Technology First Level RCP Area G    |
| Sheet TN2.2A | Technology Second Level RCP Area A   |
| Sheet TN2.2B | Technology Second Level RCP Area B   |

|              |                                    |
|--------------|------------------------------------|
| Sheet TN2.2C | Technology Second Level RCP Area C |
| Sheet TN2.2D | Technology Second Level RCP Area D |
| Sheet TN2.2E | Technology Second Level RCP Area E |
| Sheet TN2.2G | Technology Second Level RCP Area G |
| Sheet TN4.1  | Technology Enlarged Plans          |
| Sheet TN4.2  | Technology Enlarged Plans          |
| Sheet TN5.1  | Technology Details                 |
| Sheet TN5.2  | Technology Details                 |
| Sheet TN6.1  | Technology Riser Diagrams          |
| Sheet TY0.1  | Security General Notes and Legend  |
| Sheet TY1.1A | Security First Level Plan Area A   |
| Sheet TY1.1B | Security First Level Plan Area B   |
| Sheet TY1.1C | Security First Level Plan Area C   |
| Sheet TY1.1D | Security First Level Plan Area D   |
| Sheet TY1.1E | Security First Level Plan Area E   |
| Sheet TY1.1F | Security First Level Plan Area F   |
| Sheet TY1.1G | Security First Level Plan Area G   |
| Sheet TY1.1S | Security First Level Plan Area S   |
| Sheet TY1.2A | Security Second Level Plan Area A  |
| Sheet TY1.2B | Security Second Level Plan Area B  |
| Sheet TY1.2C | Security Second Level Plan Area C  |
| Sheet TY5.1  | Security Details                   |
| Sheet TY5.2  | Security Details                   |

END OF DOCUMENT 000115



# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL #4 – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 11 00 – INVITATION TO BID

### **00 11 00 Invitation To Bid**

- 1.1 McCownGordon Construction is requesting Subcontractor bid proposals for the Lee’s Summit Middle School #4 Project. The project includes the construction of a new middle school and associated site work.
- 1.2 Review Bid Packages for scope of work that are bidding within this package
- 1.3 Bid Submittals
  - 1.3.1 Bids will be received until 2:00 PM, Tuesday, September 15th, 2020.
  - 1.3.2 All bidders are encouraged to utilize the Building Connected website for submission of online bids. If online submission is not an option, hard copies of the bid may be delivered to McCownGordon’s office at 850 Main Street, KCMO 64105. Online submission will be covered in the Pre Bid Meeting and instructions can be found in the files section of the project on Building Connected.
    - 1.3.2.1 Documents to be uploaded include:
      - 1.3.2.1.1 Bid Form
      - 1.3.2.1.2 Bid Security
      - 1.3.2.1.3 Bid Package or Scope of Work
  - 1.3.3 Bids shall be directed to Ashley Pavlu, apavlu@mccowngordon.com  
McCownGordon Construction  
850 Main, Kansas City, MO 64105  
816.960.1111
  - 1.3.4 All bids shall be held for a period of **60** days.
  - 1.3.5 Bids shall be submitted on the provided bid form.
  - 1.3.6 Bid Bonds will be required for all bids over \$15,000.00.
- 1.4 Vendor Prequalification
  - 1.4.1 Prior to being awarded a contract, all bidders are required to qualify with McCownGordon. McCownGordon utilizes a secure online system to administer the qualification review process. Bidders who are not prequalified should contact Sam Dwyer (sdwyer@mccowngordon.com) or any member of the project team for access to McCownGordon’s qualification application.
  - 1.4.2 By submitting a bid, your company agrees that it will submit a recent financial statement, references and safety history prior to award of a contract
  - 1.4.3 Subcontractor will execute a copy of MGC’s current MSA.

### **00 11 17 Bid Document Access**

- 1.1 Documents can be accessed through bid solicitation software [www.buildingconnected.com](http://www.buildingconnected.com) and from the link below:  
<https://app.buildingconnected.com/public/565cdb606895000f004164f2>
- 1.2 All questions shall be submitted via e-mail to the contact noted above.

### **00 11 18 Additional Project Information**

- 1.3 A virtual pre-bid meeting will be held for this project on October 13<sup>th</sup>, 2020 @ 3:00 PM. Trade partners interested in visiting the site, may do so at their convenience.
  - 1.3.1 Pre Bid invitation  
Topic: Lee’s Summit Middle School – Site & Building Package Pre Bid

# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL #4 – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 11 00 – INVITATION TO BID

Time: October 13<sup>th</sup>, 2020 @ 3:00 PM Central Time (US and Canada)

Join Zoom Meeting

<https://nam02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fmccowngordon.zoom.us%2Fj%2F92262935349%3Fpwd%3DRWhGeG9Wa0ZIWGIPNVJkNU4xdFNTUT09&mp:data=02%7C01%7Cbtaylor%40mccowngordon.com%7C8604c9333a764345e3d108d864918d5c%7Ce84ee08f51b84292909686df1502b863%7C0%7C0%7C637369923588545794&mp;sd ata=yZNMHpBuwMUyID5C1zgVega%2FYm9A%2BhTd92%2BThiwCRE%3D&mp;reserved=0>

Dial in Numbers

888 475 4499 US Toll-free

877 853 5257 US Toll-free

**Meeting ID: 922 6293 5349**

- 1.4 Milestone Schedule Dates (per schedule included in bidding requirements)
  - 1.4.1.1 Bid Date Thursday, October 22nd, 2020 by 2PM CT
  - 1.4.1.2 Construction Start November 30<sup>th</sup>, 2020
  - 1.4.1.3 Construction Completion May, 2022
- 1.5 All questions shall be submitted via e-mail to the contact noted above.
  - 1.5.1.1 All questions shall be submitted no later than 12:00 pm, Thursday, October 15th, 2020.
- 1.6 Project Tax Status
  - 1.6.1.1 Project is NON-TAXABLE
- 1.7 Project Labor Requirements
  - 1.7.1.1 Project requires union labor for the following trades: Structural Concrete, Rough Carpentry, Overhead and Coiling Doors, Drywall and Acoustical Ceilings, Carpet and Resilient Flooring, and Resinous Flooring.
  - 1.7.1.2 This project DOES require Certified Payroll
  - 1.7.1.3 Work to occur during normal business hours.



# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 20 00 – BIDDING REQUIREMENTS

### **00 20 01 Definitions**

- 1.1 Bidding Documents include the Bidding Requirements and the proposed Subcontract Documents. The Bidding Requirements consist of the Invitation to Bid, Instructions to Bidders, the Project Manual, and other sample Bidding and Subcontract forms. The proposed Subcontract Documents consist of the Agreement between the Owner and Contractor, General Conditions of the Contract for Construction (and any Supplementary or other Conditions), Form of Agreement between Contractor and Subcontractor, Material and Equipment Contract between Contractor and Supplier, Drawings, Specifications, and all Addenda issued prior to execution of the Subcontract.
- 1.2 Definition set forth in the Subcontract Documents, is applicable to the Bidding Documents.
- 1.3 The Subcontract is the Agreement between the Contractor and Subcontractor for the performance of work by a Subcontractor or the Material and Equipment Contract between the Contractor and Supplier for the supply of materials or equipment by a Supplier.
- 1.4 The Work is the work to be performed or materials and equipment to be supplied under the scope of work of a Subcontract.
- 1.5 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Subcontract which modify or interpret the Bidding Documents by additions, deletions, clarifications, or corrections.
- 1.6 A Bid is a complete and properly signed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.
- 1.7 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or deleted for sums stated in Alternate Bids and Unit Prices.
- 1.8 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents and the Specifications, is accepted.
- 1.9 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or labor, as described in the Bidding Documents.
- 1.10 A Bidder is a person or entity who submits a Bid.
- 1.11 A Sub-Bidder is a person or entity who submits a Bid to a Bidder for materials or labor for a portion of the Work.

### **00 20 02 Bidder’s Representations**

- 1.1 Each Bidder by making his Bid represents that:
  - 1.1.1 The Bidder has read and understands the Bidding Documents and his Bid is made in accordance therewith.
  - 1.1.2 The Bidder has visited the site, has familiarized himself with the local conditions under which the work is to be performed, and has correlated his observation with the requirements of the proposed Subcontract Documents.
  - 1.1.3 The Bid is based upon the materials, systems, and equipment required by the Bidding Documents without exception.

# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 20 00 – BIDDING REQUIREMENTS

- 1.1.4 The Bidder will not later request, and will not later expect to receive, additional payment for work related to conditions which can be determined by examination of the site and the Bidding Documents.
- 1.2 Bidders and Sub-Bidders shall promptly notify the Contractor of any ambiguity, inconsistency, or error which they may discover upon examination of the Bidding Documents or of the site and local conditions.
- 1.3 All interpretations, corrections, or changes of the Bidding documents will be made by Addendum. Interpretations, corrections, or changes made in any other manner will not be binding and Bidders shall not rely upon them.

### **00 20 03 Bidding Documents**

- 1.1 Bidding Documents will be distributed by the Contractor only.
- 1.2 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner, the Contractor, nor the Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.
- 1.3 The Owner, Contractor or the Architect in making copies of the Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the work and do not confer a license or grant for any other use.
- 1.4 Plans, specifications, and addenda are available to pre-approved bidders via the bid invitation system and may be obtained by contacting Tiffany Kirkwood (see Invitation to Bid).

### **00 20 04 Interpretations and Substitutions**

- 1.1 Bidders and Sub-Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which must reach the Contractor at least seven (7) days prior to the date for receipt of Bids. All questions are to be directed to Ashley Pavlu (apavlu@mccowngordon.com) with McCownGordon Construction Company.
- 1.2 Reference in the specifications to any product, material, type, or form of construction establish a minimum standard of quality, spare parts availability, strength, durability, usefulness, serviceability, operating cost, convenience and purpose intended and shall not be construed as limiting competition. Reference to standard specifications for basic materials shall not be modified for any substitutions proposed. Proposed substitutions shall be submitted by the Bidder to the Architect in writing no later than ten (10) days prior to Bid Date. The submittal shall clearly describe the substitution for which approval is requested, including all drawings and data necessary to demonstrate acceptability. A statement setting forth the changes in other materials, equipment, or other portions of Work, including changes in the work of other contracts that incorporation of the proposed substitution would require shall be included in the submittal. The burden of proof of the merit of the proposed substitution is on the Bidder. All acceptable substitutions will be approved in Addenda prior to Bid Date. Bidders shall not rely upon approval made in any other manner. Requests for substitutions other than as qualified above will not be considered.
- 1.3 No substitutions will be allowed subsequent to the award of a Subcontract except as specifically provided in the General Requirements.

# 07-1256 – LEE'S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 20 00 – BIDDING REQUIREMENTS

### **00 20 05 Addenda**

- 1.1 Notice of Addenda will be emailed or faxed to all who are known to have received a complete set of Bidding Documents.
- 1.2 No Addenda will be issued later than (5) calendar day prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.
- 1.3 Each Bidder shall ascertain, prior to submitting his Bid, that he has received all Addenda issued and shall acknowledge their receipt on the Bid.
- 1.4 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

### **00 20 06 Form and Style of Bids**

- 1.1 Bid proposals shall be delivered as stipulated in the Invitation to Bid.
- 1.2 A Bid shall state the total lump sum price to do all Work described in the Bidding Documents under a single contract. Dollar amounts shall be stated in both words and figures, and in case of discrepancy between the two, the amount written in words shall govern.
- 1.3 Bidder shall bid all Alternate and Unit Prices requested in the Bidding Documents. The bid for Alternate and Unit Prices described in the Bidding Documents shall include all overhead, profit, and the cost of all changes required from the Base Bid conditions in order to incorporate such Work.
- 1.4 Each Bid shall be executed and signed (with name and title typed below the signature) by and in the name of the Bidder. **All bids shall be submitted on the bid form provided.**

### **00 20 07 Modification or Withdrawal of Bid**

- 1.1 Bids may not be withdrawn, modified, or canceled for a period of time as identified in specification section 00 01 00 Advertisements and Invitations following the time and date finally designated for the receipt of Bids.
- 1.2 Prior to the time and date finally designated for receipt of Bids, any Bid submitted may be modified or withdrawn by notice to the Contractor at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder.

### **00 20 08 Consideration of Bids and Subcontract Award**

- 1.1 Bids will not be accepted after the actual time and date established for receipt of Bids. Bidders shall assume full responsibility for timely delivery at the location designated for receipt of Bids.
- 1.2 Contractor, with input from Owner and Architect, shall have the right to reject any or all Bids and further to waive all informalities in bidding when deemed in the Owner's best interest.
- 1.3 In awarding a Subcontract the Contractor may take into consideration the Bidder's skill, facilities, capacity, experience, responsibility, previous work record, and financial standing and the necessity of prompt and efficient completion of work herein described. Inability of any Bidder to meet the requirements mentioned above may be cause for rejection of the Bid.

# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 20 00 – BIDDING REQUIREMENTS

- 1.4 Bidders to whom a Subcontract is awarded shall execute a Subcontract with the Contractor within seven (7) days after written notice of the award.
- 1.5 The Contractor shall have the right to waive informalities or irregularities in a Bid received and to accept the Bid which, in the Contractor’s judgment, with input from the Owner and Architect, is in the Owner’s best interest.
- 1.6 The Owner and Contractor, may interview the apparent low Bidders before Subcontracts are awarded. The interview will be to ask the Bidder questions about materials, labor, duration, scope of work, the Subcontract Documents, or the Bidder’s Prequalification Statement.
- 1.7 The Owner and Contractor shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided for in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and the Alternates accepted.
- 1.8 The Bidder acknowledges the right of the Owner or Contractor to reject any or all bids and to waive any formality or irregularity in any bid received. In addition, the Bidder recognizes the right of the Owner or Contractor to reject a bid if the Bidder failed to furnish any required bid security, or to submit the data required by the bidding documents, or if the bid is in any way incomplete or irregular.

### **00 20 09 Post Bid Information**

- 1.1 The Contractor will prepare and forward two (2) original drafts of the Master Subcontract/Work Order with the notice of award of Subcontract to the successful Bidder. Bidder shall return properly executed drafts of the Subcontract, together with required evidence of insurance, and Performance and Payment Bonds, if required, to the Contractor within seven (7) calendar days.
- 1.2 If the successful Bidder is doing business under a fictitious name, he shall furnish at no cost to Contractor, if requested, a properly certified copy of his current Certificate of Registration of Fictitious Name from the applicable state and such certificate shall remain on file with the Contractor. No Subcontract will be executed by the Contractor until such certificate is furnished by the Bidder unless there already is on file with the Contractor such a current certificate, during the period of time for which such current certificate remains in effect.
- 1.3 Any successful Bidder which is a corporation organized in a state other project location state shall furnish, at its cost, to the Contractor a properly certified copy of its current Certificate of Authority and License to do business in the applicable state. No Subcontract will be executed by the Contractor until such certificate is furnished by the Bidder unless there already is on file with the Contractor such a current certificate, in which event no additional certificate is required.
- 1.4 Any successful Bidder which is a corporation organized in the applicable state shall furnish at its own cost to the Contractor, if requested, a Certificate of Good Standing issued by the Secretary of State; such certificate to remain on file with the Contractor.

### **00 20 10 Bond Requirements**

- 1.1 All bidders shall be capable of providing payment and performance bonds for the full amount of the contract sum.
- 1.2 The Bidder shall furnish the cost to provide the following surety bonds in addition to the base bid:
  - 1.2.1 Performance Bond - To cover the faithful performance of the Subcontract.
  - 1.2.2 Labor and Material Payment Bond - To ensure payment of all obligations arising under the Subcontract

# 07-1256 – LEE'S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 20 00 – BIDDING REQUIREMENTS

- 1.3 Bonds shall be written by a surety acceptable to the Contractor.
- 1.4 If bonds are required, the Bidder shall deliver the Labor and Material Payment Bond and Performance Bond to the Contractor no later than the date of execution of the Subcontract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the work, submit evidence satisfactory to the Contractor that such bonds will be furnished and delivered in accordance with this Subparagraph.
- 1.5 Unless otherwise provided, the bonds shall be written on the Contractor's bond forms as described in 00 20 12 or any bond forms acceptable to the Contractor at its sole discretion. Bonds shall be written in the full amount of the Subcontract Sum.
- 1.6 The bonds shall be dated on or after the date of the Subcontract Work Order.
- 1.7 The Bidder shall require the Attorney-In-Fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the Power of Attorney.

### **00 20 12 Form of Agreement Between Contractor and Subcontractor**

- 1.1. Master Subcontract Agreement is attached to the end of this section.

### **00 20 12.1 Form of Agreement Between Owner and Contractor**

- 1.1. AIA 133 and 201 Agreement is attached to the end of this section

### **00 20 13 Form of Agreement Between Contractor and Supplier**

- 1.1. Master Purchasing Agreement is attached to the end of this section.

### **00 20 15 Miscellaneous Instruction to Bidders**

- 1.1 Unit Prices
  - 1.1.1 All unit prices stated on the Bid by the Bidder are prices per unit of measurement for materials or services that will be added to or deducted from the Subcontract Sum by Change Order if quantities of work required are increased or decreased. All unit prices shall include necessary material, labor, equipment, overhead, profit, supervision, permits, and fees.
- 1.2 Alternates
  - 1.2.1 Drawings and general provisions of the Subcontract, including General and Supplementary Conditions and other Division-1 Sections, apply to Alternates.
  - 1.2.2 Bidders shall submit on the Bid the amount to furnish and install the Alternates as detailed on Drawings and Specifications, and as herein described.
  - 1.2.3 The Bidder shall be responsible for all trades, materials, and workmanship involved in the Alternates to the same extent as though they were specified in the Base Bid.
  - 1.2.4 Alternates which are accepted that affect other alternates will be negotiated with the Bidder after taking bids.
- 1.3 The Contractor shall have the right to exercise or reinstate any alternate any time within 60 days after the signing of the Subcontract at the prices quoted on the Bid.





850 Main  
Kansas City, MO 64105  
816-960-1111 Fax: 816-960-1182  
Construction Management/Design-Build/General Contractor

#### MASTER SUBCONTRACT AGREEMENT

This Master Subcontract Agreement is entered into this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_  
by and between McCOWN GORDON CONSTRUCTION, LLC ("Contractor") and  
\_\_\_\_\_  
("Trade Partner").

WHEREAS, Contractor may, from time to time, enter into contracts with Owners or other parties to furnish labor, materials, supplies, equipment and facilities in connection with certain construction projects, hereinafter called "the **Project**," and

WHEREAS, in order to facilitate and expedite the work to be performed on each such Project and avoid the need to separately negotiate many of the terms and conditions of the parties' agreements on them, the parties desire to agree to certain of the terms and conditions which shall govern with respect to all work performed on such Projects,

It is, therefore, AGREED as follows:

#### 1. TERMS OF AGREEMENT.

1.1 Contractor and Trade Partner agree, as to each Project identified in writing as being governed by this Master Subcontract Agreement, to perform it in accordance with the contract between Contractor and Owner and all documents and other matters made part of said contract, including the plans, specifications and conditions for said Project prepared by the Project Architect or Engineer therefor, herein referred to as "**Architect**," together with modifications thereof and addenda thereto, herein collectively called the "**Prime Contract**," all of which will be incorporated by reference and expressly made a part of this agreement at such time as they are specifically identified in an individual Work Order executed by the parties provided such documents were given to or made available to Trade Partner. The parties agree that the form of Work Order which they shall use is that on **ATTACHMENT 1** to this Master Subcontract Agreement.

1.2 Trade Partner accepts the relationship of trust and confidence established by this agreement and covenants with Contractor to cooperate with the Owner and utilize Trade Partner's best skill, efforts and judgment in furthering the interests of Contractor; to furnish efficient business administration and supervision; to make best efforts at all times to furnish an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economical manner consistent with the Prime Contract. Trade Partner agrees to be bound to Contractor by all terms of the Prime Contract applicable to this Master Subcontract Agreement, or any individual Work Order placed pursuant to this Master Subcontract Agreement provided such documents were given to or made available to Trade Partner. Trade Partner shall fully assume and perform all such responsibilities of Contractor in connection with the performance of everything subcontracted to Trade Partner. Trade Partner will perform all Work Orders so as not to violate any terms, covenants or conditions of the Prime Contract and where any provision of the Prime Contract between Owner and Contractor is inconsistent with any provision of this Master Subcontract Agreement or individual Work Order, the Master Subcontract Agreement or Work Order shall govern.

2. **ACCEPTANCE OF SITE AND WORK REQUIREMENTS.** Prior to signing any individual Work Order, Trade Partner understands that it will have been expected to have already examined the Project site and access thereto, and the Prime Contract or any portions of it which it believes may pertain to the work of Trade Partner. Trade Partner's execution of an individual Work Order shall constitute Trade Partner's acknowledgement that it has been given access to all locations and all documents and other information it deems necessary for the proper preparation of its bid. Trade Partner represents that it is licensed and qualified to do such work, and that it has the machinery, equipment, personnel and experience to perform the work as specified within the time allotted. Contractor may at any time require evidence of Trade Partner's current and ongoing ability to complete the work. Trade Partner shall not be entitled to rely on the accuracy or completeness of any information about the site provided by the Owner except to the extent that the Contract Documents permit such reliance. Otherwise, Trade Partner shall take any and all steps it deems appropriate to ascertain for itself the characteristics of the Project site.

### 3. THE WORK

3.1 Trade Partner shall furnish all labor, qualified supervisory personnel, materials, supplies, equipment, tools, facilities and everything else necessary to perform, and shall perform, all the work for the construction and completion of the part(s) of the work of the Prime Contract as contained in **EXHIBIT "A"** to the Work Order - **Scope of Work**, in accordance with the schedule and sequence given to it from time to time, and in compliance with the plans, specifications and other contract documents contained in **EXHIBIT "B"** to the Work Order - **List of Contract Documents**, **EXHIBIT "C"** to the Work Order - **Project Schedule**, and **EXHIBIT "D"** - **Project-Specific Insurance Requirements**, each of which shall be attached to each specific Work Order, and which upon signing the Work Order shall become a part of this Subcontract.

3.2 Before and while proceeding with the work under a Work Order, Trade Partner shall accurately check everything previously, or currently being done by other trades, in any way relating to Trade Partner's work and shall determine the correctness of same. Trade Partner has a continuing obligation to review work that precedes it and if it later is found that there is an error that should have been reasonably noted and reported by the Trade Partner to Contractor, then the Trade Partner waives any claim to additional costs, expenses or damage resulting from.

3.3 All local codes affecting Trade Partner's performance of its work have been investigated by Trade Partner and compliance with such requirements is included as part of this Master Subcontract Agreement.

3.4 No materials shall be delivered to the Project site or storage areas that are not for use on this Project, and no equipment shall be delivered to or allowed to remain on the site except when it is needed for the execution of Trade Partner's Work. For all temporary equipment, construction equipment and scaffolding brought to the site, Trade Partner shall provide Contractor with written documentation, including make, model and (where available) serial numbers, and Trade Partner shall identify whether each piece of such equipment is owned or rented. Lien waivers for all rented equipment will be required prior to payment to Trade Partner of progress or final payments.

### 4. PAYMENT

4.1 Contractor agrees to pay Trade Partner for said work and everything required of Trade Partner in and by the Work Order, the sum set forth in the Work Order, subject to additions and deductions for changes as may be agreed upon in advance in writing and subject to the other terms of the Prime Contract, this Master Subcontract Agreement or the Work Order. Trade Partner shall submit to Contractor a schedule of values allocating the Work Order Price among the various line items associated with the items covered by a Work Order. It is agreed that no payments are to be made to Trade Partner until an appropriate Schedule of Values is agreed upon



by Contractor and Trade Partner, and unless Trade Partner's rate of progress, work done and materials and services furnished are satisfactory to Owner and Contractor.

4.2 Applications for Payment shall be submitted using Contractor's "Application and Certification for Payment form, **ATTACHMENT 2** to this Master Agreement. Payment shall be made only for actual work performed to the satisfaction of Owner and Contractor, and only upon Trade Partner's evidence of payment of all of its job-related obligations, including, if requested by Contractor, delivery of partial lien waivers on the form of **ATTACHMENT 3**, a current list of all sub-Trade Partners, equipment lessors and suppliers with contract values in excess of \$5,000 whose work or materials or equipment were performed or delivered during the period covered by the application for payment on the form of **ATTACHMENT 4**, and an affidavit attesting to the completeness and accuracy of the information on the Sub-Trade Partner and Materialmen List in the form of **ATTACHMENT 5** to this Master Subcontract Agreement. Payment shall be due Trade Partner seven (7) days after Contractor receives payment from Owner, less retainage as may be set forth in the Work Order which Contractor may withhold from payments otherwise due Trade Partner. In the event any items performed by Trade Partner are to be paid for at unit prices, the quantities shown are estimates only and the amounts to be paid Trade Partner shall be determined by the actual quantities of work performed or material furnished, or both, and as determined and paid for by Owner or its authorized representatives.

4.3 If the Contract Documents allow payment for stored materials, as a condition to payment, Trade Partner shall submit documentation using the bill of sale and bailment agreement forms on **ATTACHMENTS 6 AND 7** to Contractor and Owner to verify Trade Partner's title to the goods and delivery to an insured warehouse (unless the Contract Documents require the use of different forms). Trade Partner shall remain responsible for insuring and safeguarding stored materials until actually installed and accepted by Owner.

4.4 Contractor shall have the right to withhold, out of monies otherwise due to Trade Partner: the sum assessed against Contractor, or the actual cost to Contractor (whichever is greater) per day for each and every day required to complete the work beyond the time allowed in the Work Order or the Project Schedule therefor, including but not limited to liquidated damages or actual damages assessed against Contractor on account of Trade Partner's acts or omissions; any sums which Trade Partner has not paid to vendors, sub-Trade Partners, taxing authorities or other obligations associated with the Work, for or on behalf of its employees, such as withholding taxes or pension contributions, or penalties thereon, until such time as Trade Partner provides written evidence from the appropriate entity that Trade Partner's obligations have been satisfied; and an amount equal to damages arising out of Trade Partner's work or its failure to perform in accordance with this Master Subcontract Agreement or individual Work Order, including damages sustained by Contractor, until indemnity acceptable to Contractor is furnished by Trade Partner provided Trade Partner was notified in writing and has had 10 calendar days to satisfy its obligations.

4.5 Trade Partner agrees that all funds received shall be used first for payment of labor, material, equipment, supplies and services related to this work and said monies shall not be diverted to satisfy obligations of Trade Partner on other contracts until all obligations under or in connection with this Subcontract are satisfied in full. Contractor may withhold any payment or pay directly or by joint check to sub-Trade Partners or suppliers unless Trade Partner has furnished Contractor with evidence satisfactory to it that Trade Partner has paid such debts in full and performed all other obligations incumbent on Trade Partner provided Trade Partner was notified in writing and has had seven (7) days to satisfy its obligations.

4.6 Final payment under any Work Order shall be made within ten (10) days after all of the following items have occurred: (a) completion of said Project; (b) written acceptance thereof by Owner and Architect; (c) Owner has made full and final payment therefor to Contractor; (d) full releases, on the form of **ATTACHMENT 8**, of all claims against Owner, Contractor and the Project by Trade Partner and its sub-Trade Partners and suppliers; and (e) consent of Trade Partner's surety, if applicable.

4.7 Trade Partner understands that Contractor intends to pay Trade Partner out of payment proceeds received from Owner for Trade Partner's work. Accordingly, payment shall be made to Trade Partner within 7 days of receipt of such funds from Owner. In the event that Owner does not pay Contractor for the work of Trade Partner for reasons not due to the fault of Trade Partner, Trade Partner agrees that it shall not take legal action until it has given Contractor a reasonable time to pursue collection of funds against the Owner. Nothing stated in this paragraph shall prevent Trade Partner from filing a mechanic's lien against Owner's property for such non-payment, however, nor to preclude Trade Partner from taking other action sooner if such action is required to avoid forfeiture under a statute of limitation or other time limitation for action.

4.8 Under no circumstances shall prior passage of title to Owner or Contractor, prior payment by Owner or Contractor, acceptance of such release or acceptance, occupancy, use or installation of any work performed or articles delivered hereunder be deemed to (a) constitute acceptance or approval of work done under any Work Order, (b) affect the responsibility of Trade Partner to perform as required, (c) affect the right of Contractor or Owner to reject any such work determined upon inspection not to be in the condition required, or (d) be acceptance of defective work or a waiver of Contractor's rights and Trade Partner's obligations under this Master Subcontract Agreement or any individual Work Order. Without limitation on the foregoing, any acceptance of Trade Partner's work shall not relieve or discharge Trade Partner or its surety from any of its obligations and warranties.

5. **SCHEDULE OF WORK.** Trade Partner shall begin work as specified in the Work Order, and shall carry the same forward promptly, efficiently, and at a speed stated in the schedule. Trade Partner recognizes that revisions in the planning schedule are inherent in the nature of construction, which may result in revisions to the schedule of work during construction. Trade Partner acknowledges that Contractor cannot guarantee that Trade Partner will be able to start on any particular date, or continue without interruption once started. In the event that Trade Partner falls behind schedule, due to events not the fault of Contractor, Trade Partner shall work additional required hours, bring in additional materials or equipment, or take such other steps as may be deemed necessary in the opinion of Contractor to get back on schedule at no additional expense to Contractor.

6. **SUB-TRADE PARTNERS.** Prior to receiving its first payment under a Work Order, Trade Partner shall furnish to Contractor a complete list of its vendors and sub-Trade Partners on the form **ATTACHMENT 4**, to permit Contractor to ascertain on an on-going basis that such firms are complying with all pertinent requirements of the Prime Contract, this Master Subcontract Agreement or any Work Order, as well as to verify that these firms have received payment from Trade Partner from funds paid by Contractor. Trade Partner shall have a continuing duty to update its list of sub-Trade Partners and vendors, and Trade Partner's failure to do so may result in withholding of funds by Contractor in order to protect against liens and bond claims. Trade Partner shall incorporate into all sub-subcontracts and purchase orders the requirements of the Prime Contract, this Master Subcontract Agreement or any Work Order including, but not limited to, insurance, indemnification, warranties and remedies. All of Trade Partner's sub-subcontracts and purchase orders shall contain a provision permitting the assignment of such agreements to Contractor in the event of default by Trade Partner.

## **7. DELAYS**

7.1 Trade Partner shall be responsible to Contractor for the damages which Contractor may incur by reason of any delays caused or contributed to by Trade Partner, its agents, employees, suppliers or sub-Trade Partners, including but not limited to liquidated or actual damages assessed by the Owner against Contractor, provided Trade Partner was notified in writing and it was finally determined the delay was caused by the Trade Partner, claims by other Contractors or Trade Partners, as well as Contractor's own damages. If liquidated damages are included in the Prime Contract, they will be identified on the Work Order. In the event that claims are made by others against Contractor due to delays caused by Trade Partner, Trade Partner shall indemnify, defend and save harmless Contractor from all loss, damage and expense, including attorney's fees, associated with such claims.

7.2 Should Trade Partner be delayed in the performance of its work, Trade Partner may be entitled to an extension of time for performing its work, but only to the extent actually allowed to Contractor by Owner under the terms of the Prime Contract. No claim for an extension of time or damages shall be allowed to Trade Partner under any circumstances unless Trade Partner gives a written notice of a potential claim to Contractor within three (3) working days from the time of the beginning of the occurrence causing the delay, or such shorter time as may be provided in the Prime Contract.

8. **TIME.** Time is of the essence and all of the work of Trade Partner shall be fully and properly completed within the time required to permit Contractor to timely complete and fulfill all of its obligations under the Prime Contract.

9. **DEFECTIVE WORK.** In the event that any of Trade Partner's work is deemed to be defective by Contractor, Owner, Architect or any inspecting agent, building inspector or other governing approval body, Trade Partner shall immediately remove and replace that work at its own expense upon written demand by Contractor, if the Trade Partner has not responded within three (3) days of written notification or Contractor will arrange for the defective work to be removed and replaced at Trade Partner's expense.

10. **CHANGES.** Contractor may, at any time, without invalidating this Master Subcontract Agreement or individual Work Order, make any changes or alterations in the work covered by this Subcontract or order extra or additional work which it may deem expedient. No directive to perform work different or in addition to the Scope of Work of a Work Order shall be binding on Contractor unless issued in writing by an authorized representative of Contractor. With respect to such changes, or alterations, or additional or extra work, Contractor shall not be liable to Trade Partner for a sum greater than Contractor obtains from Owner on behalf of Trade Partner for such changes, unless expressly agreed upon in writing in advance. Trade Partner will not be paid for any additional or extra work or changes unless Contractor gives a written order to Trade Partner before the work is performed or changes ordered. Trade Partner shall comply with all requirements of the Prime Contract for documentation and submission of claims for additional time or money, and submit such claims to Contractor in itemized detail in time for Contractor to review them prior to required submission to Owner. If the Prime Contract does not specify a time limitation for notice of cost or time impact from changes, Trade Partner shall provide such written notice to Contractor in no more than five (5) working days from receipt of the order by Trade Partner.

11. **WARRANTY.** Trade Partner shall perform Contractor's warranty to Owner under the Prime Contract for all work under any Work Order. Further, Trade Partner unconditionally warrants that all labor, material and services furnished by it are in strict accordance with the Prime Contract, and Trade Partner shall promptly make good upon demand any defects, including the repair of the work of any other Contractor affected, to the entire approval of Contractor, Owner and Architect regardless of the expiration of any manufacturer's warranty, as directed by Contractor. Should Trade Partner refuse or neglect to proceed to promptly correct rejected materials or workmanship within three (3) calendar days of written notice from Contractor, Contractor shall have the right to have the defects remedied at the expense of Trade Partner, and deduct such amounts from sums otherwise due Trade Partner. The obligations set forth in this paragraph are continuing and shall survive occupancy, completion of the construction project, acceptance of work, or final payment to Trade Partner.

## **12. INDEMNITY**

12.1 Trade Partner agrees to indemnify, defend and hold harmless Contractor and Owner and such other parties as identified in the Prime Contract from and against (i) all claims, causes of action and expenses arising out of injury to (including death of) any persons or damage to property alleged to have been caused in whole or in part by any act or omission of Trade Partner, its agents, employees, sub-Trade Partners, suppliers or invitees, or growing out of or incidental, directly or indirectly, to the performance of the Subcontract regardless of how such

injury, death or damage be caused, and (ii) all claims, causes of action and expenses caused by any act or omission (whether or not negligent) of Trade Partner, its agents, employees, sub-Trade Partners, suppliers or invitees, in the prosecution of the Subcontract. Trade Partner shall defend all suits brought against Contractor and/or Owner on account of any such claims of liability, shall pay any settlements made or judgments rendered with respect thereto, and shall reimburse and indemnify Contractor for all expenses, including court costs and reasonable attorneys' fees, incurred by Contractor.

12.2 The obligations set forth in this paragraph, or any other indemnity obligations set forth in this Subcontract, are continuing and shall survive occupancy, completion of the construction project, acceptance of work, or final payment to Trade Partner.

### **13. LIENS**

13.1 Trade Partner shall fully indemnify, defend and hold harmless Contractor and Owner against any and all liens, claims, security interests or conditional bills of sale (hereinafter collectively referred to as "liens") of laborers or material men of Trade Partner and sub-Trade Partners of Trade Partner. If at any time there shall be evidence of a lien for which Owner or Contractor might become liable, which in any way relates to Trade Partner's work, Contractor shall have the right to retain, out of any payments then due or thereafter to become due, an amount sufficient to completely indemnify and protect Contractor and Owner against such lien.

13.2 Trade Partner shall promptly remove or discharge any lien (unless Trade Partner and Contractor have not been paid for the work covered by the lien by Owner), and if Trade Partner shall fail to do so within the lesser of the period set forth in the Prime Contract, if any, or three (3) working days after delivery of written notice from Contractor, Contractor shall, in addition to its other rights hereunder, have the right to remove and discharge the same, in order to protect its interest and as authorized agent of Trade Partner, at the expense of Trade Partner.

14. **INSURANCE.** Trade Partner agrees to procure and carry at its cost, until completion of this Subcontract and all applicable warranty periods, all insurance as evidenced on Trade Partner's certificate attached hereto and on **ATTACHMENT 9** unless greater insurance coverage is required by a specific Work Order. **Trade Partner must submit a copy of the additional insured endorsement, notice of cancellation endorsement, and insurance certificates, written on a standard ACORD form,** in the format shown on **ATTACHMENT 10**, stating that all coverages are in effect and will not be canceled without thirty (30) days' prior written notice to Contractor and such certificates **must be received by Contractor prior to commencement of Work.** Contractor may require that Trade Partner provide complete certified copies of the insurance policies required by **ATTACHMENT 9**. All insurance is to be issued by companies and with liability limits reasonably acceptable to Contractor. If Trade Partner should sub-subcontract any of its Work to a third party or issue purchase orders, Trade Partner shall see to it that such third party maintains such insurance and shall furnish evidence thereof to Contractor. Specifically, if Trade Partner's scope of work includes any design responsibility, Trade Partner and its licensed design professional shall furnish the professional liability insurance described on **ATTACHMENT 9**.

15. **SURETY BONDS.** If designated on a Work Order, Trade Partner shall provide a Performance Bond and a Payment Bond with a penal sum equal to the full amount of the Work Order, each naming Contractor as obligee in a sum not less than the amount of the Subcontract and in the form of **ATTACHMENTS 11 and 12**, unless otherwise agreed by Contractor, and with a corporate surety on each bond acceptable to Contractor. Such bonds shall be adjusted in penal sum in connection with the issuance of Change Orders to Trade Partner, through delivery of a Rider to the bonds where necessary to assure the obligation of the surety. No payment shall be due to Trade Partner until such bonds are furnished. The bonds shall assure the faithful performance of all of the stipulations of the Subcontract for which they are written and the payment of all persons furnishing labor, services, equipment or materials used or purchased for use in the work covered that Subcontract. In the event that the amount of the

Subcontract is increased, the bonds shall also automatically be increased in amount, without prior notice to the surety, and it will be the responsibility of Trade Partner to include in its proposals the cost of additional bond premiums to cover additional premiums.

**16. TERMINATION/SUSPENSION.** In the event the Prime Contract is terminated or halted under its terms or by an order of court or other public authority, or Contractor elects to take action pursuant to paragraph 17.2 below, Contractor shall, at its sole option, have the right to terminate or suspend any Work Order as of the date of such action. In the event that a Work Order is terminated, Trade Partner shall only be entitled to the actual, direct costs of all labor and material expended on the job prior to the effective date of the termination or suspension plus a sum equal to fifteen percent (15%) of all such labor and material to cover overhead and profit. In no event shall Trade Partner be entitled (a) to anticipatory profit or damages for any termination or suspension; (b) to assert a claim in quantum meruit or any other measure of damages other than that stated herein; or (c) to receive a sum in excess of what Owner pays to Contractor for such work of Trade Partner. In the event of suspension of the work covered by a Work Order, Trade Partner shall receive such adjustment to its Subcontract as is allowed under the Prime Contract.

## **17. DEFAULT**

**17.1** If Trade Partner shall become insolvent or make an assignment for the benefit of creditors or commit any act of bankruptcy, or a petition in bankruptcy shall be filed by or against Trade Partner, and Trade Partner does not immediately furnish Contractor with evidence of its intent and ability to affirm the Subcontract and complete all work in accordance with the terms of this Subcontract and any Work Order; or Trade Partner shall fail in any manner to perform the whole or any part of any term or agreement contained or assumed herein or by Work Order or the Prime Contract, Contractor shall have the right to (a) in the event of bankruptcy, petition the Bankruptcy Court for rejection of the contract; (b) provide such materials, supplies, equipment and labor in addition to any supplied by Trade Partner, as may be necessary to complete Trade Partner's work and pay for the same and deduct the amount thereof from any money which is then or would thereafter otherwise be due Trade Partner; (c) bar Trade Partner from the Project (with or without terminating the Work Order) and enter upon the premises and take possession for use and consumption in completing the work of all the materials, supplies, tools, equipment, appliances and facilities of Trade Partner thereon or thereat and complete the work, or have the same completed by others, or any combination of such methods; (d) withhold any further payment from Trade Partner until all work provided for by Trade Partner shall be wholly finished; and (e) pay for all of the same and deduct the amount so paid from any money which is then or would thereafter otherwise be due Trade Partner.

**17.2** In the event of the exercise of any default rights by Contractor as set forth above, all costs incurred, including (but not limited to) the cost of materials, labor, Trade Partners, transportation, equipment expense and rentals thereon, supplies, services, insurance, taxes, appliances, tools, utilities, power, supervision, administration, job overhead, travel, payment of claims against Trade Partner for which Contractor or Owner might be liable, or settlement of which is in the best interests of the Project, legal and accounting fees and expenses, Contractor's general overhead as allocated to the work and other costs and expenses incurred or sustained by Contractor, plus ten percent (10%) of the actual cost of the work performed, shall be deducted from the Work Order price and sums otherwise due Trade Partner.

## **18. LABOR AND EMPLOYMENT MATTERS**

**18.1** Trade Partner shall comply with the wage scales and labor policies of Contractor or as may be contained in the Prime Contract, specifically including the provisions of any agreements providing for hiring and union-security and for the making of payments under health and welfare or other fringe benefit funds or plans, to the extent that the terms of such agreements can legally be applied to the Subcontract work. Trade Partner shall not employ any workers whose employment is objected to by Contractor or Owner or which violates any such labor

agreements. Trade Partner agrees to abide by any two-gate system or other procedures designed to facilitate Project work, and agrees that its manpower, equipment and deliveries will not be delayed due to use of a two-gate system and/or union picketing. Trade Partner agrees that if any portion of such work is further subcontracted, such sub-Trade Partner shall be contractually obligated to be bound by, and observe the terms of, such collective bargaining agreements to the same extent as is herein required of Trade Partner, and that an express provision imposing such obligation upon the sub-Trade Partner shall be included in any such sub-subcontract.

18.2 In the event of a strike or stoppage of work resulting from a dispute involving or affecting the labor employed by Trade Partner or its sub-Trade Partners, Contractor may at its option terminate or suspend the right of Trade Partner to proceed on a Work Order or terminate an individual Work Order or this Master Subcontract Agreement upon 48 hours notice, and it shall be obligated only to compensate Trade Partner in accordance with paragraph 17 hereof.

18.3 Subject to Contractor's approval, Trade Partner shall employ a competent superintendent to direct its Work and shall not remove its superintendent from the work without Contractor's written approval. This superintendent shall be onsite whenever work is being performed by Trade Partner. This person shall be fluent in all languages necessary to effectively communicate with Contractor's staff and Trade Partner's staff and sub-Trade Partners. He or she shall give Contractor's Superintendent his/her home and mobile phone numbers, email address and pager number. Any employee of Trade Partner adjudged by Contractor to be unskilled or unqualified or whose employment, in Contractor's judgment, would be detrimental to Contractor's work shall promptly be removed from the Project upon receipt of written notice from Contractor and shall not be re-employed on the Project without the written consent of Contractor.

18.4 Trade Partner shall comply with all laws protecting the rights of its employees and potential employees, including Equal Employment Opportunity laws (specifically, Executive Order 11246 September 24, 1965, attached to this Subcontract as **ATTACHMENT 13**) and any relevant state acts against discrimination, and the rules, regulations, and relevant orders of the Secretary of Labor which are applicable to Trade Partner's performance of its Work. Trade Partner shall execute a copy of the EEO Compliance Certificate included in **ATTACHMENT 13**, and shall indemnify, defend and hold harmless Contractor against any expense incurred including imposition of fines which results from violation of such laws.

19. **PROTECTION OF PERSONS AND PROPERTY.** Trade Partner assumes exclusive responsibility for protection of its personnel, materials, equipment, facilities and work, including fall protection, trenches and shoring for trenches and excavations. Trade Partner shall initiate, maintain and supervise all safety precautions and programs in connection with its work, and post all necessary notices and warnings, with minimum standards as set forth on **ATTACHMENT 14** to this Master Subcontract Agreement. It shall take all reasonable precautions for the safety of, and shall provide protection to prevent damage, injury or loss to:

- (a) all its employees on the Project and all other persons who may be affected thereby;
- (b) all its work and all materials and equipment to be incorporated therein, whether in storage on or off the job site, or in transit, and regardless of whether legal title has passed to Owner under the terms of the Prime Contract, which is within the care, custody or control of Trade Partner, or any of its sub-Trade Partners;
- (c) other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

Trade Partner shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be deemed to be Trade Partner's superintendent unless otherwise designated in writing by Trade Partner to Contractor. Trade Partner shall notify Contractor of any injury to its employees, or employees of sub-Trade Partners, immediately. Trade Partner shall include a similar section in all its sub-subcontracts, but shall nevertheless remain responsible for all recordkeeping, notification and posting requirements, and for all violations of law, citations, fines or penalties assessed against any of its sub-Trade Partners. If applicable, Trade Partner shall furnish all required Material Safety Data Sheets (MSDS) for materials utilized in the course of its work. Trade Partner shall complete Contractor's Emergency Contact Information Form for each Work Order issued, using the form on **ATTACHMENT 15**.

20. **TAXES.** Taxes, as applicable under the Prime Contract, are included in the price to be paid to Trade Partner under a Work Order, and Trade Partner assumes and accepts exclusive liability for, and agrees to pay (a) all taxes, contributions, interest and penalties under any governmental or private old age benefit, welfare benefit, social security, pension, annuity, or unemployment compensation or insurance law, plan or program now existing or hereafter imposed, (b) all taxes and contributions required to be withheld from or in respect of wages and salaries, under any law now existing or hereafter imposed, including interest, and penalties, (c) all taxes measured by receipts in connection with the work under a Work Order and all sales, use, income, occupation or excise taxes, including interest and penalties, referable to any Work Order or this Master Subcontract Agreement or anything to be done or furnished by Trade Partner and all permits, fees and licenses relative to the work covered by this Subcontract. If a specific Project is tax-exempt, Contractor shall issue to Trade Partner documentation to verify this, and it will be included as an Exhibit to the Work Order, and Trade Partner shall comply with all procedures required to satisfy the Owner or government's requirements with respect to same.

21. **COMPLIANCE WITH LAWS.** Trade Partner agrees to comply with all federal, state or local laws, ordinances, regulations and administrative orders applicable to performance of work under a Work Order, and to fully indemnify and hold harmless Contractor on account of any violation by Trade Partner thereof. Trade Partner agrees to indemnify Contractor against any expense incurred including imposition of fines which results from Trade Partner's violation of such laws. Trade Partner acknowledges that its work area on any Project and all places where its materials, supplies, equipment and facilities are located are under its exclusive control and Trade Partner is solely responsible for the detection and abatement of any conditions not in compliance with such laws, and Contractor is not and shall not be responsible for them.

21.1 Trade Partner represents that, to the extent required by law, it is duly licensed as a construction contractor for the type of work covered by this Subcontract. Trade Partner's failure to obtain or maintain required licenses shall be a material default.

21.2 Trade Partner shall be responsible for ensuring compliance with the Immigration Reform Act of 1986 and all laws regulating immigration and the verification of eligibility for employment of persons. Trade Partner shall use Form I-9, attached hereto as **ATTACHMENT 16**, to verify that its employees are eligible for employment and keep records of such verification for the periods prescribed by the Immigration Reform Act of 1986.

21.3 Effective January 1, 2009, all Trade Partners and sub-Trade Partners with contract amounts in excess of \$5,000 on public projects in Missouri are required to verify the employment eligibility status of employees through the E-verify federal program administered by the Department of Homeland Security, U.S. Citizenship and Immigration Services. If the Project is a public one performed in Missouri, Trade Partner will be required to use E-Verify and complete an affidavit attesting to its compliance as required by R.S. Mo. 285.530.1 on a form to be included with the Work Order. At such time as Trade Partners are required to utilize E-Verify for federal contract work or other public or private work, compliance with any such requirements shall also be part of this Subcontract. Trade Partner shall indemnify, defend and hold harmless Contractor against any expense incurred including imposition of fines which results from violation of such laws.

**21.4 Missouri Safety Training Requirements** In the event that the Project involves a public works project in the State of Missouri, Trade Partner and all sub-Trade Partners shall provide a 10-hour OSHA construction safety program or similar program approved by the Missouri Department of Labor and Industrial Relations, to be completed on site by all employees within sixty (60) days of beginning work on the Project, pursuant to Section 292.675, Revised Statutes of Missouri. Trade Partners and sub-Trade Partners in violation of this requirement will forfeit to the public owner \$2,500 plus \$100 per day for each employee without training. Public bodies and Contractor may withhold penalties from the payment due to Trade Partner and its sub-Trade Partners. To assure compliance with this requirement, Trade Partner and all sub-Trade Partners will be required to provide such training and complete an affidavit attesting to its compliance as required by statute on a form to be included with the Work Order.

**22. SAMPLES, SHOP DRAWINGS.** Trade Partner shall submit all samples, shop drawings, test and other data as required hereunder by the earlier of thirty (30) days from the date of the Work Order or the date required by the Project Schedule. Any handling, transmittal, approval or anything else done by Contractor with respect to these shall not relieve Trade Partner from responsibility for errors in the samples, shop drawings or other data and shall not relieve Trade Partner of its obligations to perform its work in accordance with the intent of the Contract Documents or any term of this Master Subcontract Agreement or Work Order and of its responsibilities for any deviations from the requirements of either of them.

**23. DECISIONS.** Any decision concerning the work, or termination thereof, the quantity or classification of anything done hereunder, the intent or application of the Prime Contract or claims for payment or compensation hereunder in respect to work done or omitted under a Work Order which is binding upon Contractor shall bind Trade Partner absolutely, whether such decision be made by Owner, Architect or any officer, agency or tribunal empowered to render the same by the Prime Contract or as a result of any procedure referred to therein or contemplated thereby.

#### **24. DISPUTES**

**24.1** In case of any dispute between Trade Partner and Contractor, Trade Partner agrees to be bound to Contractor to the same extent Contractor is bound to Owner by the terms of the Prime Contract and by any decisions made thereunder by Owner, Architect or any other party authorized to render the same by the Prime Contract. Trade Partner agrees to exhaust all remedies which are available to it through Contractor, or to participate in mediation, prior to instituting a separate action in court or otherwise; and in the event a separate action is instituted prior to the exhaustion of such remedies, Trade Partner agrees to stay such action pending Contractor's exhaustion of Trade Partner's remedies against Owner. Trade Partner agrees that the dispute resolution provisions of the Contract Documents, if any, including binding arbitration, are incorporated by reference as part of this Subcontract so as to be binding as to disputes between Trade Partner and Contractor that involve, in whole or in part, questions of fact and/or law that are common to any dispute between Contractor and Owner or others similarly bound to such dispute resolution procedures, and that all such disputes may be consolidated for hearing and resolution by the same arbitration or other tribunal specified in the contract between Contractor and Owner. Trade Partner consents to the joinder and participation of other parties as Contractor deems appropriate.

**24.2** If Trade Partner makes a claim of any nature, Trade Partner agrees to present such claim in writing, with full documentation therefor, to Contractor within sufficient time for Contractor to take the action required within the time limitations of the Prime Contract for asserting claims against Owner. Contractor shall not be obligated to appeal from any decision, or to prosecute any claim on behalf of Trade Partner, and Contractor may, at its option, abandon to Trade Partner any such claim by giving written notice to Trade Partner that Contractor will



no longer prosecute such claim. In such event, Trade Partner shall have the right to prosecute such claim in the name of Contractor, but at Trade Partner's own cost and expense.

24.3 Trade Partner agrees to participate in such dispute resolution procedure (including binding arbitration) as is contained in the Prime Contract, or if Contractor does not elect to require use of procedures in the Prime Contract, to participate in mediation and/or arbitration under the Construction Industry Rules of the American Arbitration Association. Contractor shall make its election to require use of either procedure by written notice to Trade Partner within thirty (30) days of receipt of Trade Partner's claim, or with delivery of Contractor/Owner's claim against Trade Partner.

24.4 It is the intent of Contractor to resolve disputes as quickly, efficient and amicably as possible. To this end, Contractor reserves the right to require a meeting with senior management of Trade Partner within ten (10) days of demand by Contractor to resolve outstanding disputes. Both parties must commit to use their best faith efforts to resolve disputes, and meet again, as necessary, to facilitate this process. If the dispute has not been resolved within twenty (20) days of the first meeting, Trade Partner may proceed with its other remedies under this Master Subcontract Agreement.

24.5 Nothing contained herein shall excuse Trade Partner from completion of the work in the manner provided in this Master Subcontract Agreement or Work Order, nor shall the pendency of any dispute or arbitration proceeding excuse any interruption, deficiency, delay, default or noncompliance therewith.

24.6 This Master Subcontract Agreement, Work Orders and all disputes between the parties shall be governed by the laws of the State of Missouri, and the jurisdiction and venue for any action between the parties shall be solely and exclusively in Jackson County, Missouri, unless the Project is covered by the Miller Act, 40 U.S.C. § 270 *et seq.*, in which case jurisdiction shall lie exclusively in the United States District Court for the Western District of Missouri. In the event that this clause is not enforceable, the parties agree that a lawsuit filed in any other jurisdiction, including the jurisdiction where the project work is performed, may be stayed by the court upon request of either party to allow time for issues to be resolved in an action brought in the court referenced above, and any judgment entered in a Missouri court shall be fully enforceable in that original court action.

25. **DESIGN RESPONSIBILITY.** If any portion of the Work subcontracted to Trade Partner includes responsibility for design, Trade Partner represents that the design will be prepared by a licensed design professional in the state where the Project is located in accordance with all laws or regulations governing the same. Trade Partner further agrees that such design shall be prepared in accordance with the highest standard of care for design professionals in the locality where the Project is located.

26. **INDEPENDENT CONTRACTOR.** Trade Partner shall be and is an independent Contractor and assumes all of the rights, obligations and liabilities applicable to it as such. The exercise of any of the rights reserved to Contractor in this Master Subcontract Agreement shall only be for the purpose of assuring that the work is being performed and results accomplished according to the terms of this Master Subcontract Agreement and according to the terms of the Prime Contract.

27. **FACILITIES, CLEANUP.** Trade Partner shall provide at its own expense whatever services, storage sheds, work shops and offices are necessary for the performance of its work. Trade Partner shall clean up on a daily basis all refuse, rubbish, scrap materials and leave its work area broom-clean. Trade Partner shall deposit waste in containers as directed by Contractor. If Trade Partner refuses or fails to perform this cleaning as directed by Contractor after 24 hours notice, Contractor shall have the right and power to proceed with said cleaning, and Trade Partner will on demand repay to Contractor the cost thereof at the rate of \$45.00 per hour, or Contractor may deduct such sums from sums otherwise due Trade Partner. This includes responsibility for the proper removal of any material identified by the EPA on its List of Identified Hazardous Waste or that displays hazardous characteristics.

28. **INTERPRETATION.**

28.1 All negotiations, quotations, proposals and/or agreements prior to the date of this Subcontract not included herein are hereby voided and this is the sole agreement of the parties.

28.2 This Subcontract shall bind the representatives, executors, administrators, successors, receivers, and assigns of the parties hereto.

28.3 No provision contained in this Subcontract shall create or give to third parties any claim or right of action against Contractor or Trade Partner in addition to those legally existing in the absence of such provision.

28.4 The captions in this Subcontract are for convenience or reference only and shall not define or limit any of the terms or provisions hereof.

28.5 If any portion of this document should be found to be unenforceable, it is agreed that the remaining provisions shall remain in full force and effect.

28.6 Additions or changes to this Subcontract shall be in writing signed by the parties hereto.

28.7 Waiver of any provision of this Subcontract or any breach hereof shall not constitute a waiver of any other provision or any subsequent breach of the same or any other provision hereof.

28.8 Although drawn by Contractor, this Master Subcontract Agreement shall, in the event of any dispute over its meaning or application, be interpreted fairly and reasonably, and neither more strongly for or against either party.

29. **ASSIGNMENT.** Trade Partner shall not assign or subcontract any Work Order or any part of its scope, or any interest therein, or assign any monies due or to become due to Trade Partner without first obtaining the written consent of Contractor, and no such assignment shall be binding on Contractor unless and until accepted in writing by Contractor.

30. **NOTICE.** Trade Partner agrees that three (3) working days' written notice of any action Contractor proposes to take hereunder shall be sufficient. Written notice shall be deemed to have been duly served upon Trade Partner when delivered to Trade Partner by mail, facsimile transmission, or in person. Any notices or documentation submitted to Trade Partner for further submission to Owner or its designer or any governmental entity shall be submitted to Contractor sufficiently in advance to allow for Contractor's review and subsequent transmittal.

31. **PRECONDITION.** No Work Order shall become binding on Contractor until Trade Partner has furnished Contractor with the required Certificates of Insurance and Endorsements, and any other documents or items specified in the this Master Subcontract Agreement, Work Order and Prime Contract, **AND TRADE PARTNER MAY NOT BEGIN WORK UNTIL REQUIRED ITEMS HAVE BEEN SUBMITTED**, and Trade Partner has been approved by Architect, Owner and any other party required so to do by the Prime Contract. If any of them shall fail or refuse to approve Trade Partner, the Work Order shall be null, void and of no force or effect and Contractor shall owe nothing to Trade Partner.

32. The following ATTACHMENTS are incorporated herein by reference as fully as if reprinted herein and are all integral parts of this Agreement, and shall apply to any Work Orders entered into by the Parties:

1. Form of Work Order
2. Form of Application and Certification for Payment

3. Form of Partial Waiver of Lien and Release of Claims
4. Form of List of Sub-Trade Partners, Equipment Lessors and Vendors
5. Form of Affidavit of Accuracy of List of Sub-Trade Partners, Equipment Lessors and Vendors
6. Form of Bill of Sale
7. Form of Bailment Agreement
8. Form of Final Waiver of Lien and Release of Claims
9. Insurance Requirements
10. Sample ACORD Certificate of Insurance
11. Form of Performance Bond
12. Form of Payment Bond
13. EEO Requirements and EEO Compliance Certificate
14. McCownGordon Safety Requirements
15. McCownGordon Emergency Contact Information Form
16. I-9 Immigration Form

**IN WITNESS WHEREOF**, the parties have executed this Subcontract in multiple copies on the day and year first above written.

\_\_\_\_\_

\_\_\_\_\_  
**McCown Gordon Construction, L.L.C.**



By: \_\_\_\_\_

By: Jeff Placek

Title \_\_\_\_\_

Title: Chief Financial Officer

Date: \_\_\_\_\_

Date:



McCownGordon  
850 Main Street  
Kansas City, Missouri 64105  
Phone: (816) 960-1111  
Fax: (816) 960-1182

Project Name Here

**Attachment No. 001 - Example Work Order**

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## SWO - Scope of Work

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DATE CREATED:

CONTRACT COMPANY:

CREATED BY:

CONTRACT STATUS:

EXECUTED:

OWNER CONTRACT DATE:

MASTER  
AGREEMENT DATE:

SIGNED CONTRACT RECEIVED DATE:

DEFAULT RETAINAGE:

LIQUIDATED DAMAGES:

OVERHEAD MARKUP:

BONDS REQUIRED:

PROFIT MARKUP:

TAX EXEMPT:

OH&P For Work Performed  
By Own Forces:

OH&P For Work Performed  
By Others:

DESCRIPTION:

INCLUSIONS:

EXCLUSIONS:

EXHIBITS:

ATTACHMENTS:

---

Subcontractor is expected to fulfill all the obligations contained in the Master Subcontract Agreement (the "MSA"), and, in addition, the following requirements. In the event of any inconsistency between the MSA and this Work Order, Subcontractor shall comply with the more stringent requirement.

**McCownGordon**  
850 Main Street  
Kansas City, Missouri 64105

SUBCONTRACTOR  
Street Address  
City, State, Zip Code

---

SIGNATURE

DATE

---

SIGNATURE

DATE



# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 2

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### TRADE PARTNER ACCOUNTING REQUIREMENTS

#### Trade Partner Invoicing Process:

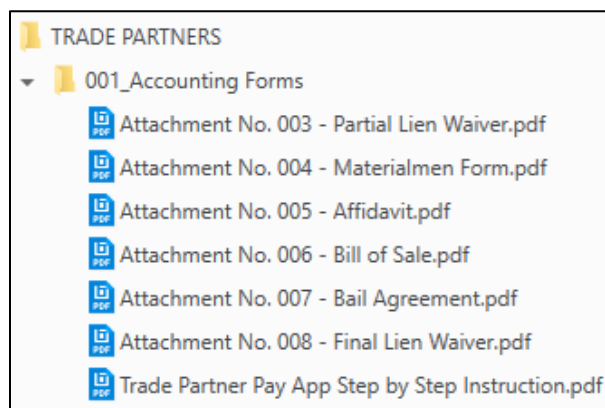
1. Due: 20<sup>th</sup> day of the month forecasting thru the end of the month
2. Documents requested to support invoicing:
  - a. Attachment 3 – Partial Lien Waiver – Every month
  - b. Attachment 4 – Materialmen Form – Every month
  - c. Attachment 5 – Affidavit – Must be notarized – Every month
  - d. Sub Tier Lien Waivers from previous month – Every month except first billing
  - e. Attachment 6 – Bill of Sale – Only if billing for stored materials
  - f. Attachment 7 – Bail Agreement – Only required if billing for stored materials
  - g. Photo documentation – Only required if billing for stored materials
  - h. Attachment 8 – Final Lien Release – Only required for final invoice
3. Submission:
  - a. Invoice submission will be made through Procore
  - b. Refer to McCownGordon Trade Partner Invoicing for instruction located in the Procore Documents tab of this project.
4. Any invoice not directly tied to a work order should be submitted to [ap@mccowngordon.com](mailto:ap@mccowngordon.com)

If you have questions related to pay applications monthly progress process, please contact the applicable Accounting email address: [SubPayables@mccowngordon.com](mailto:SubPayables@mccowngordon.com) or [ap@mccowngordon.com](mailto:ap@mccowngordon.com).

NOTE: Submitting all required documents along with the Pay Application will speed up payment

#### Location of Accounting Documents for download:

1. Procore Documents Tab of this project:
  - a. Select the folder **TRADE PARTNERS**
  - b. Select the folder **001\_Accounting Forms**



If you have questions related to the location of Accounting documents, please contact the Project Coordinator for this project.

## PAGE ONE OF TWO

850 Main Street  
Kansas City, MO 64105  
Attn.: Accounting  
816.960-1111 FAX 816.472.1605

Via Architect:

Contract for: type of work

| CHANGE ORDER SUMMARY        |             |             | ADDITIONS     | DEDUCTIONS |
|-----------------------------|-------------|-------------|---------------|------------|
| Number                      | Description | Date Issued |               |            |
|                             |             |             |               |            |
|                             |             |             |               |            |
|                             |             |             |               |            |
|                             |             |             |               |            |
|                             |             |             |               |            |
|                             |             |             |               |            |
|                             |             |             |               |            |
|                             |             |             |               |            |
|                             |             |             |               |            |
|                             |             |             |               |            |
| Subtotals                   |             |             | \$0.00        | \$0.00     |
| Net change by Change Orders |             |             | <b>\$0.00</b> |            |

**0**  
**Name of Person Certifying**

By: \_\_\_\_\_ Date: \_\_\_\_\_

**McCown Gordon Construction L.L.C.:**

By: \_\_\_\_\_ Date: \_\_\_\_\_

|                               |  |
|-------------------------------|--|
| <b>INVOICE #</b>              |  |
| <b>APPLICATION DATE:</b>      |  |
| <b>PERIOD TO:</b>             |  |
| <b>PROJECT #:</b>             |  |
| <b>MASTER AGREEMENT DATE:</b> |  |
| <b>WORK ORDER DATE:</b>       |  |

|   |        |
|---|--------|
| 1 ORIGINAL CONTRACT                         | \$0.00 |
| 2 Net change by Change Orders.....          | \$0.00 |
| 3 CONTRACT SUM TO DATE (Line 1 plus 2)..... | \$0.00 |
| 4 TOTAL COMPLETED AND STORED TO DATE.....   | \$0.00 |

|           |                   |                            |        |
|-----------|-------------------|----------------------------|--------|
| <b>5</b>  | <b>RETAINAGE:</b> |                            |        |
| <b>a.</b> | <u>          </u> | % of Completed Work _____  | \$0.00 |
|           |                   | (Column F+G on G703)       |        |
| <b>b.</b> | <u>    0%    </u> | % of Stored Material _____ | \$0.00 |
|           |                   | (Column H on G703)         |        |

|   |               |
|---|---------------|
| Total retainage (Lines 5a + 5b or<br>Total in Column J of G703..... | \$0.00        |
| <b>6 TOTAL EARNED LESS RETAINAGE.....</b>                           | <b>\$0.00</b> |

|   |               |
|---|---------------|
| (Line 4 Less Line 5 Total)                          |               |
| <b>7 LESS PREVIOUS CERTIFICATES FOR</b>             |               |
| <b>PAYMENT (Line 6 from prior Certificate).....</b> | <b>\$0.00</b> |

|                              |               |
|------------------------------|---------------|
| <b>8 CURRENT PAYMENT DUE</b> | <b>\$0.00</b> |
|------------------------------|---------------|

**9** BALANCE TO FINISH PLUS RETAINAGE..... **\$0.00**  
(Line 3 less Line 6)

**Trade Partner Notary:**

Subscribed and sworn before me this \_\_\_\_\_

Notary Public: \_\_\_\_\_

My Commission expires:  

State of:  County of:



PAGE TWO OF TWO

0  
01/00/00  
01/00/00

**PERIOD TO:**

|          |                     |                          |         | (C + D)               |                           | (I - F)     |                            | (E x J)                            |                 | (E - I)           | (I x retention %) |
|----------|---------------------|--------------------------|---------|-----------------------|---------------------------|-------------|----------------------------|------------------------------------|-----------------|-------------------|-------------------|
| A        | B                   | C                        | D       | E                     | F                         | G           | H                          | I                                  | J               | K                 | L                 |
| ITEM NO. | DESCRIPTION OF WORK | ORIGINAL SCHEDULED VALUE | CHANGES | TOTAL SCHEDULED VALUE | WORK COMPLETED            |             | MATERIALS PRESENTLY STORED | TOTAL COMPLETED AND STORED TO DATE | J<br>% COMPLETE | BALANCE TO FINISH | RETAINAGE         |
|          |                     |                          |         |                       | FROM PREVIOUS APPLICATION | THIS PERIOD |                            |                                    |                 |                   |                   |
|          |                     |                          |         |                       |                           |             |                            |                                    |                 |                   |                   |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          |                     |                          |         | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | 0.00%           | \$0.00            | \$0.00            |
|          | TOTAL               | \$0                      | \$0.00  | \$0                   | \$0.00                    | \$0.00      | \$0.00                     | \$0.00                             | #DIV/0!         | \$0.00            | \$0.00            |

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 3

TRADE PARTNER, SUB-TIER OR MATERIALMAN PARTIAL RELEASE OF LIEN  
AND WAIVER OF CLAIMS

To: McCownGordon Construction LLC, the Owner of the real estate (the "Realty") identified below, any Lender(s) having any loans secured by the Realty, the Applicant's Contractor (if not the General Contractor) and other parties, if any, having any interest in (hereinafter collectively the "Beneficiaries").

The "Realty" (Owner): \_\_\_\_\_

The undersigned hereby applies for payment, certifies and waives lien rights, bond rights and all other claims.

Payment Request Amount: \$ \_\_\_\_\_ by \_\_\_\_\_  
Trade Partner

Name Date of last work covered by payment request: \_\_\_\_\_

### Certificate

The undersigned, contingent upon the issuance, final clearance and payment of a valuable consideration of the sum stated above, and being familiar with the penalties for false certification, does hereby certify to the Beneficiaries that:

1. The labor performed and the equipment and material supplied through the date of last work covered by the payment request reference above, represent the actual value of work accomplished under the terms of the undersigned's agreement and all authorized changes thereto concerning work to be performed on the Realty (hereinafter the "Contract").
2. No labor, equipment or materials have been supplied under contracts or agreements with the undersigned, either verbal or written, or any arrangements of any type whatsoever, other than under the Contract and duly authorized and executed change orders, except as specifically noted below:
3. Payment in full, less retainage if any, has been made by the undersigned through the period covered by all prior payments (a) to all of the undersigned's sub-Trade Partners, equipment providers, materialmen and laborers, and (b) for all materials and labor used or furnished by the undersigned in connection with the performance of the Contract. The undersigned represents and warrants that it owes no monies or other things of value to any sub-Trade Partner, materialman, person or entity for work performed or material supplied through the date of the most recent payment by Owner, except as noted below:
4. The undersigned has complied with Federal, State and Local tax laws, including, without limitation, Income Tax Withholding, Sales Tax, Fringe Benefits owed pursuant to collective bargaining agreements, Social Security, Unemployment Compensation and Worker's Compensation laws, insofar as applicable to the performance of the contract. Specifically, the undersigned has paid, or out of the proceeds of this payment will promptly pay, all sales or use tax due and owing.
5. The undersigned acknowledges and agrees that it is receiving the funds paid in consideration of this Application as a trustee, and said funds will be held in trust for the benefit of all sub-Trade Partners, materialmen, suppliers and laborers who supplied work for which the Beneficiaries or their property might be liable, and that the undersigned shall have no interest in such funds until all these obligations have been satisfied in full.

### Partial Waiver and Release of Claims

NOW, THEREFORE, the undersigned, upon receipt of the sum of \$ \_\_\_\_\_ Check# \_\_\_\_\_ (Payments to date including current payment) for all work through \_\_\_\_\_ irrevocably and unconditionally releases and waives any and all mechanic's liens or other liens or right to claim any and all mechanic's liens or other liens against the Realty, except as pertains to unpaid retainage. Additionally, the undersigned waives and releases any other claims against the Owner, the property or McCownGordon Construction LLC, its sureties on any bonds, or any other claims of any kind whatsoever in connection with this

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 3

TRADE PARTNER, SUB-TIER OR MATERIALMAN PARTIAL RELEASE OF LIEN  
AND WAIVER OF CLAIMS

Contract and with the Realty. The undersigned shall indemnify and hold the Beneficiaries and their respective successors and assigns harmless against any lien, bond, claims or suits in connection with the materials, labor, and everything else in connection with this Contract.

Trade Partner: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

State of \_\_\_\_\_

County of \_\_\_\_\_

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_, before me, the undersigned, personally appeared \_\_\_\_\_ of he/she executed \_\_\_\_\_, known to me to be the person who executed this document and acknowledged to me that the same for the purposes therein stated.

\_\_\_\_\_  
Notary Public in and for said County and State

\_\_\_\_\_  
Commission Expires

McCownGordon PROJECT NUMBER : \_\_\_\_\_

McCownGordon PROJECT NAME : \_\_\_\_\_

TRADE PARTNER FIRM: \_\_\_\_\_

**ATTACHMENT 4 – Materialmen List of Sub-tier, Subcontractors and Equipment Suppliers**

McCownGordon Project Name/No: \_\_\_\_\_

Trade Partner Name: \_\_\_\_\_

Progress Invoice No: \_\_\_\_\_

Progress Invoice Date: \_\_\_\_\_

☐ Check here if you are using Sub-Tier Contractors, Equipment Lessors and / or Materialmen on this project.

The following is a list of all of the Sub-tier, Equipment Lessors and Materialmen which are being utilized on this project with the approximate dollar amount for the purchase. A Partial and /or Final Lien Waiver is required from any Sub-Tiers, Equipment Lessors or Materialmen that have a contract amount  $\geq$  \$20,000.00. Failure to provide this required documentation will result in the Payment Application being rejected by McCownGordon.

| COMPANY NAME | COMPANY ADDRESS | PHONE | CONTRACT AMOUNT (\$) | PAID TO DATE | REQUISITION<br>AMOUNT THIS<br>APPLICATION | BALANCE |
|--------------|-----------------|-------|----------------------|--------------|---|---------|
|              |                 |       |                      |              |   |         |
|              |                 |       |                      |              |   |         |
|              |                 |       |                      |              |   |         |
|              |                 |       |                      |              |   |         |
|              |                 |       |                      |              |   |         |
|              |                 |       |                      |              |   |         |

COMPLETE THE SECTION BELOW FOR ALL TEMPORARY EQUIPMENT & SCAFFOLDING BROUGHT TO THE PROJECT SITE.

| COMPANY NAME | EQUIPMENT TYPE | MAKE /<br>MODEL | SERIAL NUMBER | RENTED or OWNED<br>If Equip. is Rented<br>please attach a copy<br>of the Lien Waiver<br>from the Rental<br>Company | NAME OF RENTAL COMPANY |
|--------------|----------------|-----------------|---------------|--|------------------------|
|              |                |                 |               |  |                        |
|              |                |                 |               |  |                        |
|              |                |                 |               |  |                        |
|              |                |                 |               |  |                        |
|              |                |                 |               |  |                        |
|              |                |                 |               |  |                        |

PLEASE CONTINUE ON TO A SECOND PAGE IF  
NEEDED.

To be approved by McCown Gordon Construction prior to payment

Project Manager Approval: \_\_\_\_\_

Date: \_\_\_\_\_

Project Accountant: \_\_\_\_\_

Date: \_\_\_\_\_

**Note: This Sub-tier, Equipment Lessor and Materialmen list should be attached with all progress invoices irrespective of whether Sub tier contractors and Materialmen are being utilized or not**

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 5

AFFIDAVIT

### AFFIDAVIT FORM

STATE OF \_\_\_\_\_}

COUNTY OF \_\_\_\_\_}

\_\_\_\_\_ being duly sworn on his oath deposes and says: that he/she \_\_\_\_\_  
(Owner / Officer) (Title)

of the \_\_\_\_\_, a Trade Partner of \_\_\_\_\_  
(Company Name) (Type of Work – Scope of Work)

on the \_\_\_\_\_ located at \_\_\_\_\_;  
(Project Title) (Project Address)

That he is familiar with the provisions for penalties for false certification; that he certifies that all bills for labor, material, services or other things of value including, but not limited to, withholding taxes, social security taxes, unemployment taxes and fringe benefits furnished by or through them before the date of \_\_\_\_\_ under the Subcontract with McCownGordon Construction, LLC have been fully paid, settled and satisfied; that the companies and parties listed on Standard Attachment 4: Sub-tier Contractor and Materialmen List are his only material suppliers or Trade Partners for this job for the period ending \_\_\_\_\_; that he understands that McCownGordon Construction, LLC, or anyone on their behalf may and will act and rely upon this instrument in releasing any funds due or owing the said \_\_\_\_\_.

McCownGordon Construction, LLC relies totally on the accuracy of \_\_\_\_\_ with respect to the names of the Trade Partners and suppliers and their respective amounts due. If after final payment has been made in good faith to \_\_\_\_\_ and any additional claims, invoices, bills or liens are presented for unpaid materials, equipment or labor, \_\_\_\_\_ agrees to indemnify and release McCownGordon Construction, LLC of from any liability associated with said claims, invoices, bills or liens.

Sales tax has been paid on all materials and any other taxes on labor or other services have been accrued and/or remitted to the proper taxing authorities. I further certify that we are registered to do business within the State of this project.

Subscribed, and sworn before me, \_\_\_\_\_ this \_\_\_\_\_, day of \_\_\_\_\_.  
(Month/Year)

By: \_\_\_\_\_  
(Trade Partner Representative)

Title: \_\_\_\_\_

Notary: \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

PROJECT NUMBER / NAME: \_\_\_\_\_ TRADE PARTNER FIRM: \_\_\_\_\_

# MASTER SUBCONTRACT AGREEMENT ATTACHMENT 6

BILL OF SALE

SELLER:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

In consideration of payments made by \_\_\_\_\_ ("Buyer") referenced in the agreement dated \_\_\_\_\_, 20\_\_\_\_, receipt of which is hereby acknowledged, Seller declares and certifies that it now possesses, and does hereby grant, sell, transfer and deliver to Buyer all right, title and interest in the following goods:

Buyer to have all right and title to the goods in himself and his executors, administrators and assigns forever and Seller, on behalf of itself, its successors and assigns, will warrant and defend the title to said goods and chattels hereby sold unto Buyer, its successors and assigns, forever, against the lawful claims and demands of all persons. It is expressly understood and agreed that the acceptance of the goods described herein is not a waiver of any right of action that the Buyer may have for breach of warranty or any other cause under the agreement referenced above or at law.

IN WITNESS WHEREOF, Seller has executed this Agreement the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

Seller: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public in and for said County and State

My commission expires:

\_\_\_\_\_

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 7

### BAIL AGREEMENT

BAILOR: Owner/ McCown Gordon Construction LLC

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BAILEE: Trade Partner/Supplier

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#### LOCATION OF STORAGE:

The goods and materials described below are held and stored at the above referenced location pursuant to the Contract by and between Bailee, as Trade Partner/Supplier, and Owner/ McCownGordon Construction LLC as Contractor, for Work to be performed at the \_\_\_\_\_ Project located at \_\_\_\_\_.  
In consideration of payment made to the undersigned Bailee, the receipt and sufficiency of which are admitted, the Bailee agrees:

1. to keep said goods and materials at the above-mentioned address, separate and apart from all other goods and identified as subject to this bailment,
2. to keep said goods and materials fully insured against all risk of physical loss or damage,
3. to keep said goods protected from the weather, commingling, vandalism and/or diversion from said Project, and
4. to deliver said goods and materials to the Project site in conjunction with the performance of Bailee's Contract referenced above or upon the direction of Bailor and no other. The Bailee acknowledges that it has no ownership rights or title in, nor shall claim any lien upon, said goods and materials.

| QUANTITY | DESCRIPTION OF ITEM |
|----------|---------------------|
|          |                     |
|          |                     |
|          |                     |
|          |                     |
|          |                     |
|          |                     |

Received and Acknowledged:

Contractor/Supplier (Bailee)

Dated: \_\_\_\_\_

By: \_\_\_\_\_

Authorized Signature

# MASTER SUBCONTRACT AGREEMENT ATTACHMENT 8

## TRADE PARTNER, SUB-TIER CONTRACTOR OR MATERIALMAN FINAL RELEASE OF LIEN AND WAIVER OF CLAIMS

To: McCownGordon Construction LLC, the Owner of the real estate (the "Realty") identified below, any Lender(s) having any loans secured by the Realty, the Applicant's Contractor (if not the General Contractor) and other parties, if any, having any interest in (hereinafter collectively the "Beneficiaries").

The "Realty": \_\_\_\_\_

The undersigned hereby applies for payment, certifies and waives lien rights, bond rights and all other claims.

Payment Request Amount: \$ \_\_\_\_\_ by \_\_\_\_\_  
(Trade partner Name)

Date of last work covered by payment request: \_\_\_\_\_  
Certificate

The undersigned, contingent upon the issuance, final clearance and payment of a valuable consideration of the amount stated above, and being familiar with the penalties for false certification, does hereby certify to the Beneficiaries that:

1. The amount requested for labor performed and equipment and material supplied on this Project or in connection with the Property reference above, represent the actual value of work accomplished under the terms of the undersigned's agreement and all authorized changes thereto concerning work to be performed on the Realty (hereinafter the "Contract").
2. No labor, equipment or materials have been supplied under contracts or agreements with the undersigned, either verbal or written, or any arrangements of any type whatsoever.
3. Payment in full has been made by the undersigned through the period covered by all prior payments (a) to all of the undersigned's sub-tier contractors, equipment providers, materialmen and laborers, and (b) for all materials and labor used or furnished by the undersigned in connection with the performance of the Contract. The undersigned represents and warrants that it owes no monies or other things of value to any sub-tier contractor, materialman, person or entity for work performed or material supplied through the date of the most recent payment by Owner, and that the payments that have been or will be made out of this final payment to such persons or firms will fully and completely compensate them for all work in connection with the Project.
4. The undersigned has complied with Federal, State and Local tax laws, including, without limitation, Income Tax Withholding, Sales Tax, Fringe Benefits owed pursuant to collective bargaining agreements, Social Security, Unemployment Compensation and Worker's Compensation laws, insofar as applicable to the performance of the contract.
5. The undersigned acknowledges and agrees that it is receiving the funds paid in consideration of this Application as a trustee, and said funds will be held in trust for the benefit of all sub-tier contractors, materialmen, suppliers and laborers who supplied work for which the Beneficiaries or their property might be liable, and that the undersigned shall have no interest in such funds until all these obligations have been satisfied in full.

### Final Waiver and Release of Claims

NOW, THEREFORE, the undersigned acknowledges receipt of prior payments in the sum of \$ \_\_\_\_\_ (Payments to date), and contingent upon receipt of the sum of \$ \_\_\_\_\_ (final payment) for all work completed through date of waiver for which the undersigned irrevocably and unconditionally releases and waives any and all mechanic's liens or other liens or right to claim any and all mechanic's liens or other liens against the Realty. Additionally, the undersigned waives and releases any other claims against the Owner, the property or McCownGordon Construction LLC, its sureties on any bonds, or any other claims of any kind whatsoever in connection with this Contract and with the Realty.



# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 8

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### SUBCONTRACTOR, SUB-TIER CONTRACTOR OR MATERIALMAN FINAL RELEASE OF LIEN AND WAIVER OF CLAIMS

The undersigned shall indemnify and hold the Beneficiaries and their respective successors and assigns harmless against any lien, bond, claims or suits in connection with the materials, labor, and everything else in connection with this Contract.

Trade partner: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

State of \_\_\_\_\_

County of \_\_\_\_\_

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned, personally appeared \_\_\_\_\_, known to me to be the person who executed this document and acknowledged to me that he/she executed the same for the purposes therein stated.

\_\_\_\_\_  
Notary Public in and for said County and State

\_\_\_\_\_  
Commission Expires

McCownGordon PROJECT NUMBER : \_\_\_\_\_

McCownGordon PROJECT NAME : \_\_\_\_\_

TRADE PARTNER FIRM: \_\_\_\_\_

# MSA ATTACHMENT 9

## INSURANCE REQUIREMENTS

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1. **General Requirements.** Subcontractor agrees to procure and carry, at its sole cost, until completion and final acceptance of the work under this Agreement, and all applicable warranty periods, (and as a condition precedent to payment), all insurance, with identical limits of liability and scope of coverages, as required of McCownGordon ("Contractor") in the Prime Contract, or such higher amounts as set forth below. Such insurance will protect Subcontractor (and its consultants, or anyone directly or indirectly employed by any of them or anyone for whose acts they may be liable) from claims arising out of its operations.
  - 1.1. **Blanket Coverage:** If you are working on multiple projects for Contractor, provide blanket coverage showing maximum limits. Please include in the description box "for any and all projects contracted with McCownGordon Construction, LLC." If your broker cannot provide a blanket certificate, Contractor will accept a certificate referencing the specific project in lieu of "any and all projects."
  - 1.2. All insurance policies required herein are to be written by a company duly entered and authorized to transact that class of insurance in the state where the work is to be performed. All policies written by private carriers are to be written by carriers with an A.M. Best rating of "A-VII" or better.
  - 1.3. Contractor reserves the right to request for review certified copies of any and all insurance policies required herein.
  - 1.4. Subcontractor shall furnish an **ACORD Form 25** Certificate of Insurance, evidencing insurance with conditions and coverage as required herein. Furnishing certificates of insurance does not obligate Contractor or its agents to approve, evaluate, or notify Subcontractor of its compliance or non-compliance with the requirements set forth herein. In no way shall receipt of Subcontractor's certificate of insurance negate, reduce, limit or waive Contractor's right to enforce the requirements herein. Contractor shall have the right to examine any policy for compliance.
  - 1.5. Subcontractor shall have the Certificate of Insurance completed with the Certificate Holder listed as:  
**McCownGordon Construction, LLC**  
**c/o IMA Certificate Compliance**  
**1705 17th Street, Suite 100**  
**Denver, CO 80202**
  - 1.6. Subcontractor is required to register with IMA Certificate Compliance, Contractor's certificate compliance system. Subcontractor will receive a registration e-mail from [certificatecompliance@imacorp.com](mailto:certificatecompliance@imacorp.com). Follow the instructions therein to complete registration. Your broker will be required to upload a certificate on your behalf. Certificates not emailed directly from insurance brokers/agents will not be accepted. Certificates received through the mail will not be accepted. If your broker has questions, they may contact IMA directly at 303-615-7994 or at [certificatecompliance@imacorp.com](mailto:certificatecompliance@imacorp.com).
2. Subcontractor shall provide the following insurance with coverage and limits as outlined:
  - 2.1. **Commercial General Liability Insurance.** Subcontractor shall obtain and maintain Commercial General Liability Insurance on **ISO form CG 00 01** occurrence form or equivalent for hazards of: (i) construction operation, (ii) subcontractors and sub-subcontractors (iii) independent contractors, (iv) products and

# MSA ATTACHMENT 9

## INSURANCE REQUIREMENTS

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completed operations (with completed operations to remain in force for two years after project completion), (v) explosion, collapse and underground, and (vi) contractual liability, including personal injury, death and property damage. **Each Project shall maintain minimum limits of \$1,000,000.00 each occurrence and \$2,000,000.00 general aggregate, and \$2,000,000.00 in product & completed operations and shall include:**

- 2.2. General Aggregate Limit Per Project
- 2.3. Contingent Liability for operations performed by Subcontractor;
- 2.4. Contractual Liability to insure the Indemnification clause contained in this MSA. To the fullest extent permitted by law, with no Contractual Liability Exclusions modifying or deleting the definition of "insured contract" from the unaltered ISO CG 00 01 Edition date 10/01 (CG 24 26 or similar);
- 2.5. **Additional Insured Endorsement:** The Subcontractor shall require its insurance company, to the fullest extent permitted by law, to name and include McCownGordon, the Owner, and others as required by the Prime Contract, as Additional Insured under Subcontractor's Commercial General Liability insurance policy, with primary/non-contributory coverage, to provide coverage to the Additional Insured for liability due to the acts, omissions, negligence or fault of Subcontractor or its employees, agents or representatives. Additional Insured endorsement(s) shall provide that any person or organization that Subcontractor is required to add as an Additional Insured under the Prime Contract shall be included as an Additional Insured. Endorsements limiting coverage to parties with whom Subcontractor has a direct contract with will not be accepted. Coverage shall include both ongoing and completed operations. Vicarious or imputed forms of Additional Insured endorsements will not be accepted. Evidence by endorsement or policy language of additional insured and primary and non-contributory coverage must be provided on forms acceptable to Contractor. Copies of such endorsements must be included with the certificate.
- 2.6. **Blanket Waiver of Subrogation:** Subcontractor agrees to waive all rights of recovery on a blanket basis. If a blanket waiver is not provided, the policy shall be specifically endorsed for this project, naming the Additional Insured parties as set forth above.
- 2.7. The following exclusions are *absolutely prohibited* and shall not be included in Subcontractor's policy if applicable to the work:
  - 2.7.1. No exclusion for "third-party action over suits" or any similar restriction of coverage applicable to claims brought against others by an employee of Subcontractor or its subcontractors.
  - 2.7.2. No damage to Work performed by Subcontractor exclusion (CG 22 94 or similar).
  - 2.7.3. No exclusion for subsidence, which is specifically prohibited for any work involving excavation, soil stabilization, earth retention, concrete, structural steel, landscaping, waterproofing, fire protection and plumbing.
  - 2.7.4. No "residential" exclusion that would void or restrict coverage due to the nature of the Work.
  - 2.7.5. No EIFS exclusion
- 2.8. **Comprehensive Automobile Liability Insurance.**
  - 2.8.1. Subcontractor shall obtain and maintain comprehensive automobile insurance, including contractual liabilities insuring the indemnities set forth in this MSA, covering all owned, non-owned and hired automobiles used in connection with the services or other work hereunder and shall have **minimum bodily injury and property damage limits of \$1,000,000.00 combined single limit per accident.** Coverage shall include McCownGordon, the Owner, and others as required by the Prime Contract as additional insured. If blanket coverage is not provided for the Additional Insured, the

# MSA ATTACHMENT 9

## INSURANCE REQUIREMENTS

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policy shall be specifically endorsed for this project, naming the Additional Insureds as required under Section 2.1.4. Subcontractor agrees to waive all rights of recovery on a blanket basis. If a blanket waiver is not provided, the policy shall be specifically endorsed for this project, naming the Additional Insured parties. Pollution Liability - Broadened Coverage and MCS-90 endorsement shall be procured when applicable.

### **2.9. Workers' Compensation and Employer's Liability Insurance.**

- 2.9.1. Subcontractor shall obtain and maintain Worker's Compensation Insurance to cover the statutory limits of the Workers' Compensation laws of the state in which the work is to be performed and when applicable to Federal Laws, Voluntary Compensation and Employer's Liability (including occupational disease) coverage **with limits not less than \$1,000,000.00 bodily injury by accident, each accident, \$1,000,000.00 bodily injury by disease, each employee, and \$1,000,000.00 bodily injury by disease policy limit, for all workers on site, regardless of whether a worker is also an owner of Subcontractor.** The Insurance shall provide a waiver of subrogation in favor of Contractor (and Owner if required by the Prime Contract).
- 2.9.2. Where applicable, Workers' Compensation policy coverage shall include the United State Longshore & Harbor Workers' Compensation Act, the Jones Act and an all states endorsement. Workers' Compensation certificates must clearly identify that coverage applies in the state where the project is located.
- 2.9.3. If State Law does not require Employers' Liability Insurance, Subcontractor shall obtain and maintain Employers' Liability Insurance either by endorsing their Workers' Compensation Insurance policy or by endorsing their Commercial General Liability policy with a Stop Gap endorsement.

### **2.10. Umbrella/Excess Liability Insurance.**

- 2.10.1. Subcontractor shall obtain and maintain Umbrella/Excess Liability Insurance. This insurance shall provide excess insurance, over and above the Employers' Liability, Commercial General Liability, and Automobile Liability policies on a following form basis. The limit of liability for this insurance shall be as follows:
- 2.10.2. All Subcontractors shall provide **a minimum of \$5,000,000.00 each occurrence and \$5,000,000.00 in the aggregate;**
- 2.10.3. Subcontractors providing work including but not limited to the following: work that is part of the building envelope, crane operation, caissons, piling, soil stabilization, underpinning, tunneling, dewatering, earth retention systems, excavation, and structural elements of the building shall provide **a minimum of \$10,000,000.00 each occurrence and \$10,000,000.00 in the aggregate.** Higher Umbrella limits may be required by Contractor on a per project basis.

### **2.11. Professional Liability Insurance.**

- 2.11.1. Subcontractor and any of its sub-subcontractors whose scope of work includes any professional services, including but not limited to: design, architecture, engineering, testing, surveying, design/build services, temporary engineering, engineered excavations, shoring systems, post-tension supply, structural pre-cast concrete, or fire protection systems, or whose scope of Work includes the delegated design of any component of their Work, including but not limited to; helical piers, retaining walls, platform scaffold systems, site security, swimming pools, data cabling, window washing equipment, concrete form systems, structural steel, specialized millwork,

# MSA ATTACHMENT 9

## INSURANCE REQUIREMENTS

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roofing/waterproofing systems, curtain-wall, mechanical, electrical, or fire alarm systems **must obtain and maintain Professional Liability Insurance**. The policy shall be written with a limit of liability as required in the Prime Contract with a **minimum of \$1,000,000.00 for each claim and aggregate**. Such policy shall continue in force for the applicable State Statute of Limitations and/or Repose in which the Work is located after Substantial Completion of the Work of the entire Project. **Deductibles shall not exceed \$50,000.00**, to be paid by Subcontractor. Higher limits may be required by Contractor on a project-by-project basis. If the Subcontractor subcontracts professional services to an outside firm, the Subcontractor shall also require the outside firm to procure and maintain Professional Liability Insurance in like form and limits, as set forth above or as stated the Prime Contract, **whichever requires the greater coverage or limits of liability, and provide a certificate of insurance evidencing such coverage. The design professional's agreement and insurance shall not include any limitation of liability, except to the extent consequential damages are waived in the Prime Contract.**

### 2.12. **Pollution Liability Insurance.**

- 2.12.1. Subcontractor and any of its sub-subcontractors providing work related to environmental services, building enclosure systems, plumbing, heating, ventilation, air conditioning, drywall, insulation, building foundations, or any work which could generate Microbial Matter, Mold, Fungi or Bacteria, and any work involving the use of hazardous materials **must obtain and maintain a separate Pollution Liability Insurance policy**. Such insurance shall include coverage for the Hold-Harmless or Indemnification Clause contained in the agreement the Subcontractor has with the Contractor. The policy shall be written with a limit of liability as required in the Prime Contract with a minimum of **\$1,000,000.00 each occurrence and aggregate. Deductibles shall not exceed \$50,000.00, to be paid by the Subcontractor**. Higher limits may be required by Contractor on a project by project basis. Additionally, the Pollution Liability Insurance policy shall name McCownGordon and all other parties as required under the Prime Contract as Additional Insureds.
- 2.12.2. Unless otherwise determined acceptable by Contractor, the policy shall cover the liability of the Subcontractor during the process of construction, removal, storage, encapsulation, transport and disposal of hazardous waste and contaminated soil and/or asbestos abatement. The policy shall include coverage for on-site and off-site bodily injury and loss of damage to, or loss of use of property, directly or indirectly arising out of the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, liquids or gas, waste materials or other irritants, contaminants or pollutants into or upon the land, the atmosphere or any water course or body of water, whether it be gradual or sudden and accidental, including no exclusion for mold or asbestos. The policy shall also include defense and clean-up costs.

- 2.13. **Equipment Floater.** The Subcontractor shall obtain and maintain coverage for Subcontractor's equipment, tools, and business personal property (whether owned, rented, or borrowed) that are used or are in connection with the Work. Such insurance purchased by the Subcontractor is the only coverage available to the Subcontractor for such equipment. Contractor is not responsible for any equipment, tools, or business personal property of any kind that belongs to Subcontractor. Should the Subcontractor borrow, lease, or rent Contractor's equipment, the policy shall be written to provide coverage against Special Causes of Loss, subject to a **minimum limit of \$50,000.00 per item**, or such amount as Contractor may require and a limit of **\$10,000.00 for Rental Cost**. Coverage shall also include a **minimum limit of**

# MSA ATTACHMENT 9

## INSURANCE REQUIREMENTS

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**\$10,000.00 for pollution cleanup costs.** Subcontractor shall be responsible for any and all extra expenses including loss of use, arising out of damage to the equipment caused by the operation, maintenance or use of said equipment, including any deductible to which the insurance may be subject.

**2.13.1. AN INSTALLTION FLOATER IS REQUIRED WHEN SUBCONTRACTOR IS SEEKING PAYMENT OF MATERIALS AND/OR EQUIPMENT STORED BY THE SUBCONTRACTOR AWAY FROM THE JOB SITE AND AWAITING DELIVERY.** This insurance must provide coverage against Special Causes of Loss while the materials and/or equipment are being stored or transported. Contractor and Owner must be included as Loss Payees. The limit of liability shall not be less than the total value of all materials and/or equipment for all projects with Contractor for which payment has been requested.

**2.14. Unmanned Aerial Systems Liability Insurance ("Drone" Insurance).** If Subcontractor operates any "Unmanned Aerial System" or "UAS," or hires any such operations through a vendor or sub-subcontractor, Subcontractor shall obtain and maintain liability insurance for operations of the UAS. This liability insurance shall be provided by either a separate aviation policy or an endorsement to the general liability policy required hereunder, provided that the limit of liability shall be **no less than \$1,000,000.00 per occurrence**. Regardless of the form of insurance provided, McCownGordon, Owner, and any other party as required by Contractor shall be included as additional insureds and a waiver of subrogation shall apply in favor of all additional insured parties. Subcontractor shall require compliance with these same terms and conditions of any subcontractor or vendor whom it engages in the use or operation of a UAS.

**2.14.1.** Subcontractor further acknowledges and agrees that it is solely responsible for the airworthiness of any such aircraft. Subcontractor warrants that, at a minimum, all aircraft will be registered, maintained and operated in accordance with: (a) All applicable manuals inclusive but not limited to the manufacturers and operators maintenance and operations manuals; (b) Federal Aviation Regulations, Mandatory Advisory Circulars or other Airworthiness Directives issued by the FAA; (c) The manufacturer's airworthiness limitations; (d) Manufacturer or FAA mandated inspection schedules, overhaul schedules, and calendar retirement dates; and (e) Service Bulletins.

**2.14.2.** For the purposes of this Section, "UAS" includes all elements required for flight including but not limited to ground control stations, data links, dashboards, applications, survey equipment and the unmanned aerial vehicle ("UAV" or "Drone") of the subject unmanned system. UAS, UAV, and Drone are used interchangeably herein.

**2.15. Leased Employee Liability.** If Subcontractor leases one or more employees through the use of a payroll, employee management or other company, and workers compensation/employer's liability coverage is not provided by the payroll, employee, management or other company, then the Subcontractor must directly procure workers' compensation/employer's liability insurance. The workers' compensation and employer's liability coverage provided to and for the leased employees by the payroll, employee management or other company shall be evidenced and include an Alternate Employer/Leased Employee Endorsement, naming Subcontractor as the alternate employer. The employer's liability must be scheduled under applicable umbrella (except in state where employer's liability is unlimited).

**2.16. Builders Risk. It is the responsibility of the Subcontractor to inquire about Builders' Risk coverage.**

**2.16.1.** If required by the Prime Contract: McCownGordon and Subcontractor waive all rights against (1) each other and any of their Vendors, agents and employees, each of the other, and (2) the Owner,

# MSA ATTACHMENT 9

## INSURANCE REQUIREMENTS

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the Architect, the Architect's consultants, separate contractors, and any of their subcontractors, sub-subcontractors, agents and employees for damages caused by fire or other perils to the extent covered by property insurance provided under the Prime Contract or other property insurance applicable to the Work, except such rights as they may have to proceeds of such insurance held by the Owner as fiduciary. Subcontractor shall require of Subcontractor's agents and employees, by appropriate agreements, written where legally required for validity, similar waivers in favor of other parties enumerated herein. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

2.17. Waiver of Subrogation. To the extent permitted by law, all insurance policies shall include a waiver of any right of subrogation of the insurers thereunder against McCownGordon, the Project Owner, and their assigns, subsidiaries, affiliates, employees, insurers and underwriters. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity has an insurable interest in the property damaged.

2.18. Special Provisions.

2.18.1. Notice of Cancellation. The Subcontractor's insurance policies shall be endorsed to provide Contractor with a **30-day Notice of Cancellation** for reasons other than nonpayment of premium, and a **10-day Notice of Cancellation** for the reason of nonpayment of premium. If any insurer does not make available such endorsement(s), as an alternative, Subcontractor's insurance agent or broker shall provide a written statement that the agent or broker will endeavor to provide the required Notices of Cancellation. Acceptance of such alternative notice is subject to Contractor's sole discretion.

2.18.2. Insurance Primary. All policies of insurance, excluding Professional Liability, required herein shall be written as primary policies, and not in excess of the coverage of the Additional Insured parties outlined in 2.1.4.

2.18.3. No liability policies shall contain a Self-Insured Retention (SIR) or Deductible greater than \$50,000.00 per claim/occurrence, or \$50,000.00 in aggregate. The Subcontractor's General Liability policy shall be amended to exempt the Additional Insured coverage from the SIR or Deductible requirements, or expressly allow payments by the Additional Insured to satisfy the named insured's SIR or Deductible amount.

2.18.4. No Limitation of Liability. The required coverages referred to and set forth herein shall in no way affect, nor are they intended as a limitation on, Subcontractor's liability with respect to its performance of the Work.

2.18.5. All policies shall be maintained for the statute of repose.

2.18.6. The Subcontractor shall be responsible for procuring all policies of insurance consistent with the insurance requirements provided herein. All coverage as required herein may be met through the use of primary and excess policies so long as the total amount of insurance coverage provided is equal to or greater than the amount specified herein.

2.18.7. Approval, disapproval or failure to act by Contractor or their agents regarding any insurance required of Subcontractor shall not relieve Subcontractor of full responsibility for its obligations hereunder, and the bankruptcy, insolvency or denial of coverage by the insurance company shall

# MSA ATTACHMENT 9

## INSURANCE REQUIREMENTS

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not exonerate the Subcontractor from liability. In the event any Insurer issues a reservation of rights for Contractor as an Additional Insured, Contractor shall be entitled to employ independent counsel at Subcontractor's expense.

2.18.8. No special payments shall be made by Contractor for any insurance that the Subcontractor may be required to carry; Subcontractor agrees that all costs of insurance are included in the Subcontract price and unit prices.

2.18.9. If Subcontractor fails to procure and maintain in force the insurance required herein, Contractor shall have the right, but not the obligation, to obtain such insurance and the Subcontractor shall pay the cost thereof, or the cost thereof may be deducted from amounts otherwise due Subcontractor

2.18.10. Failure to procure and maintain the insurance set forth herein this will constitute a breach of this Agreement, and Subcontractor shall be liable to Contractor for all damages, losses, costs, attorneys' fees and other expenses incurred by Contractor resulting from such breach.

2.18.11. **Sub-Subcontractors' Insurance.** Subcontractor shall require all sub-subcontractors providing equipment, materials or services directly to Subcontractor in connection with Subcontractor's scope of work to obtain, maintain and keep in force coverages in accordance with the requirements set forth herein during the time they are involved in performance of services or other work hereunder. But for Parties as required under 2.1.4 being listed as additional insured under such sub-subcontractor's applicable insurance, the types and limits of insurance required of the sub-subcontractor may vary based on the work to be performed by sub-subcontractor. The insurance carried by the sub-subcontractor shall not reduce or eliminate any of the Subcontractor's contractual responsibilities for the work or negligence of sub-subcontractor hired by Subcontractor. Subcontractor shall obtain certificates of insurance and additional insured endorsements evidencing such coverage and provide Contractor with such certificates and endorsements, if requested. Subcontractor shall not be excused from its obligations to cause such sub-subcontractors to meet the insurance coverage requirements set forth herein unless Contractor waives such requirement in writing. Such waiver shall be effective only as to such requirements and for such sub-subcontractor specifically identified in such writing.

2.19. **Suppliers.** Material Suppliers making direct deliveries to the Project Site must meet the below requirements and submit a Certificate of Insurance with Contractor, Owner (and other parties, if and as required by the Prime Contract) included as Additional Insureds. If utilizing a third-party carrier please submit a blanket copy of their standard Certificate of Insurance for our records.

Automobile coverage of the standard 1,000,000

State Statutory workers' compensation coverage

General Liability of 1,000,000 as listed above. (Modification of limits may be necessary)

**The Certificate you provide MUST comply with these requirements. The Certificate of Insurance shall be provided to McCownGordon Construction with the executed agreement. NO SUBCONTRACTOR SHALL BE ALLOWED TO ENTER A MCCOWNGORDON JOBSITE WITHOUT A COMPLIANT CERTIFICATE OF INSURANCE.**



# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 10

### PERFORMANCE BOND

#### SUBCONTRACT PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_ (herein called the "Principal"), as Principal, and \_\_\_\_\_, a corporation organized and existing under the laws of the State of \_\_\_\_\_ (hereinafter called the "Surety"), as Surety, are held and firmly bound unto McCownGordon Construction LLC (hereinafter called the "Obligee"), as Obligee, in the sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for the payment of which sum well and truly to be made, the said Principal and Surety bind themselves, and their respective heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Obligee has entered into a written contract (hereinafter called the "Prime Contract") with \_\_\_\_\_ (hereinafter called the "Owner") for \_\_\_\_\_ which Prime Contract is hereby referred to and made a part hereof; and

WHEREAS, the Principal has entered into a written Subcontract Agreement with the Obligee, dated \_\_\_\_\_ to perform, as subcontractor, certain portions of the work in connection with said Prime Contract, consisting of \_\_\_\_\_, which Subcontract Agreement is hereby referred to and made a part hereof.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if the said Principal shall well and truly perform and keep all the undertakings, covenants, terms, conditions and agreements of said Subcontract Agreement within the time period provided therein and any extensions thereof that may be granted by the Obligee and during the life of any guaranty required under said Subcontract Agreement, and perform all obligations and guarantees of the Obligee relating to such work under the Prime Contract with the Owner, and shall also well and truly perform the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said Subcontract Agreement that may hereafter be made, and shall defend, indemnify and save harmless said Obligee of and from any and all claims, losses, damages, penalties, and expenses, including interest, costs and attorney's fees, which the said Obligee may sustain by reason of said Principal's failure so to do, then this obligation shall be null and void; otherwise it shall remain in full force and effect. Surety shall assume and commence performance of its obligations within 30 days' written notice of Subcontractor's default.

The said Surety agrees that no change, extension of time, alteration, addition, omission, or other modification of the terms of said Subcontract Agreement or Prime Contract, or both, or in the scope of the work to be performed or in the method of performance, or in the manner, time or amount of payments as provided therein, assented to by Obligee, whether made under expressed agreement or not, shall in anywise affect the said Surety's obligation on this Bond, and it does hereby waive notice and consents to any such change, alteration, modification or amendment.

IN WITNESS WHEREOF, the said Principal and Surety have hereunder set their hands and seals, this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
(Principal)

\_\_\_\_\_  
(Surety)

\_\_\_\_\_  
(Business Address)

\_\_\_\_\_  
(Business Address)

By: \_\_\_\_\_  
(Signature and Title)

By: \_\_\_\_\_  
(Signature and Title)

Witness: \_\_\_\_\_

Witness: \_\_\_\_\_

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 11

### SUBCONTRACT PAYMENT BOND

### PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS, that \_\_\_\_\_ (hereinafter called the "Principal"), as Principal, and \_\_\_\_\_, a corporation organized and existing under the laws of the State of \_\_\_\_\_ (hereinafter called the "Surety"), as Surety, are held and firmly bound unto McCownGordon Construction LLC (hereinafter called the "Obligee"), as Obligee, in the sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_) for the payment of which sum well and truly to be made, the said Principal and Surety bind themselves, and their respective heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Obligee has entered into a written contract (hereinafter called the "Prime Contract") with \_\_\_\_\_ (hereinafter called the "Owner") for \_\_\_\_\_, which Prime Contract is hereby referred to and made a part hereof; and

WHEREAS, the Principal has entered into a written Subcontract Agreement with the Obligee, dated \_\_\_\_\_ to perform, as subcontractor, certain portions of the work in connection with said Prime Contract, consisting of \_\_\_\_\_, which Subcontract Agreement is hereby referred to and made a part hereof.

NOW, THEREFORE, THE CONDITIONS OF THIS OBLIGATION ARE SUCH that if the said Principal shall pay promptly and in full the claims of all persons performing labor or furnishing materials, supplies and equipment in the prosecution of the work provided for in said Subcontract Agreement and any and all modifications of said Subcontract Agreement that may hereafter be made, and shall defend, indemnify and save harmless the Obligee from any and all claims, costs, damages, penalties, including attorney's fees and expenses, for all taxes, insurance premiums, any and all contributions, allowances, deductions or other payments, however termed, required by statute or union labor agreements, including voluntary payments made thereof by the Obligee to insure the orderly prosecution of work, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The said Surety agrees that no change, extension of time, alteration, addition, omission, or other modification of the terms of said Subcontract Agreement or Prime Contract, or both, or in the scope of the work to be performed or in the method of performance, or in the manner, time or amount of payments as provided therein, assented to by Obligee, whether made under expressed agreement or not, shall in anywise affect the said Surety's obligation on this Bond, and it does hereby waive notice and consents to any such change, alteration, modification or amendment.

Subject to the benefit of the Obligee, the Principal and Surety agree that this Bond shall insure to the benefit of all persons performing labor or furnishing materials, supplies and equipment in the prosecution of the work provided for in said Subcontract Agreement, as well as to the Obligee, and that such persons may maintain independent actions upon this Bond in their own names.

IN WITNESS WHEREOF, the said Principal and Surety have hereunder set their hands and seals, this \_\_\_\_\_ day of \_\_\_\_\_.

\_\_\_\_\_  
(Principal)

\_\_\_\_\_  
(Surety)

\_\_\_\_\_  
(Business Address)

\_\_\_\_\_  
(Business Address)

By: \_\_\_\_\_  
(Signature and Title)

By: \_\_\_\_\_  
(Signature and Title)

Witness: \_\_\_\_\_

Witness: \_\_\_\_\_

# MASTER SUBCONTRACT AGREEMENT ATTACHMENT 12

## EEO REQUIREMENTS AND EEO COMPLIANCE

Trade Partner shall comply with all laws protecting the rights of its employees and potential employees, including Equal Employment Opportunity laws (specifically, Executive Order 11246 September 24, 1965) and to K.S.A. 44-1030. Unless exempted by rules, regulations, or orders of the Secretary of Labor, issued pursuant to Section 204 of the Executive Order, Trade Partner specifically agrees as follows:

(1) Trade Partner will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. Trade Partner will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates or pay or other forms of compensation; and selection for training, including apprenticeship. Trade Partner agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth its provisions of this nondiscrimination clause.

(2) Trade Partner will, in all solicitations or advertisements for employees placed by or on behalf of Trade Partner, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

(3) Trade Partner will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or worker's representative of Trade Partner's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) Trade Partner will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

Pursuant to K.S.A. 44-1030, Trade Partner specifically agrees as follows:

(1) Trade Partner shall observe the provisions of the Kansas Act Against Discrimination and shall not discriminate against any person in the performance of work under the Subcontract because of race, religion, color, sex, disability, national origin or ancestry;

(2) in all solicitations or advertisements for employees, Trade Partner shall include the phrase, "equal opportunity employer," or a similar phrase to be approved by the Kansas human rights commission;

(3) if Trade Partner fails to comply with the manner in which Trade Partner reports to the Kansas human rights commission in accordance with the provisions of K.S.A. 44-1031 and amendments thereto, Trade Partner shall be deemed to have breached the Subcontract and it may be canceled, terminated or suspended, in whole or in part, by MGCC or the contracting agency; and

(4) if Trade Partner is found guilty of a violation of the Kansas act against discrimination under a decision or order of the commission which has become final, Trade Partner shall be deemed to have breached the Subcontract and it may be canceled, terminated or suspended, in whole or in part, by McCownGordon or the contracting agency.

## EEO COMPLIANCE CERTIFICATE

Trade Partner certifies to McCownGordon Construction LLC ("Contractor") that throughout the period covered Trade Partner will comply with all applicable provisions of Executive Order 11246 as revised from time to time and as implemented by Title 41 of the Code of Federal Regulations, particularly Chapters 1, 50 and 60, as the same may be amended from time to time.

Trade Partner further certifies and agrees that each of the following provisions is made a part of each subcontract between Trade Partner and Contractor, entered, unless, and to the extent that, because of dollar amount or otherwise, the subcontract is not required to contain the provision:

### I. NON-DISCRIMINATION IN EMPLOYMENT

(a) The Trade Partner will recruit and hire employees who are disabled veterans, Vietnam era veterans, and individuals with handicaps and will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Trade Partner will take affirmative action to ensure that applicants are employed, and that employees are treated during employment

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 13

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### EEO REQUIREMENTS AND EEO COMPLIANCE

without regard to status such as disabled veterans, Vietnam era veterans, handicapped individuals or because of race, color, religion, sex or national origin. Such action shall include, but not be limited to, the following employment, upgrading demotion, or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Trade Partner agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this non-discrimination clause.

(b) The Trade Partner will, in all solicitations or advertisements for employees placed by or on behalf of the Trade Partner, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

(c) The Trade Partner will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract of understanding, a notice to be provided by the agency contracting officer, advising the labor union or worker's representative if the Trade Partner's commitments under Equal Opportunity Clause, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Trade Partner will comply with all provisions of Executive Order 11246 of September 24, 1965, and the rules, regulations and relevant orders of the Secretary of Labor.

(e) The Trade Partner will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

(f) In the event of the Trade Partner's noncompliance with the Equal Opportunity Clause of this subcontract or with any part of such rules, regulations or orders, this subcontract may be canceled, terminated or suspended in whole or in part and the Trade Partner may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rules, regulations or orders of the Secretary of Labor, or as otherwise provided by law.

(g) The Trade Partner will include the provisions of paragraphs (a) through (g) in every subcontract unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provision will be binding upon each Trade Partner or vendor. The Trade Partner will take such action with respect to any subcontract as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event the Trade Partner becomes involved in, or is threatened with litigation with a Trade Partner or vendor as a result of such direction by the contracting agency, the Trade Partner may request the United States to enter into such litigation to protect the interests of the United States.

### II. CERTIFICATION OF NONSEGREGATED FACILITIES

Trade Partner does not, and during the performance of each subcontract with Contractor, will not maintain or provide for his employees and segregated facilities at any of his establishments, and does not and will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. Trade Partner agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this certificate. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color or national origin, because of habit, local custom or otherwise. He further agrees that (except where he has obtained identical certifications from proposed Trade Partners for specific time periods) he will obtain identical certifications from proposed Trade Partners prior to the award of subcontracts exceeding

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 13

### EEO REQUIREMENTS AND EEO COMPLIANCE

\$10,000 which are not exempt from the provisions of the Equal Opportunity Clause; that he will retain such certifications in his files, and that he will forward the following to such proposed Trade Partners (except where the proposed Trade Partners have submitted identical certifications for specific time periods): NOTICE TO PROSPECTIVE TRADE PARTNERS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES. A Certification of

Nonsegregated Facilities, as required by Chapter 60-1.8 of Title 41 of the Code of Federal Regulations must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semi-annually or annually).

NOTE: Whoever knowingly or willfully makes any false, fictitious or fraudulent representations may be liable for criminal prosecutions under 18 U.S.C. 1001.

#### III. FILING CERTIFICATE

Trade Partner has failed or will file the necessary compliance reports, including Standard Form 100 (EEO-1) where and when required by law and applicable regulations, including, without limitation, the Civil Rights Act of 1964 as amended by the Equal Employment Opportunity Act of 1972 and regulations in 41 CFR 60-1.7. Trade Partner has required and will require similar certification and filing from its non-exempt suppliers.

#### IV. AFFIRMATIVE ACTION CERTIFICATE

Trade Partner has developed, is maintaining and will continue to maintain the written affirmative action compliance program to guarantee equal employment opportunity to minority groups required by applicable law and regulations, including, without limitation, those appearing in 41 CFR 60-1.40. Trade Partner has required and will require similar certification from each of its non-exempt suppliers.

#### V. UTILIZATION OF SMALL BUSINESS CONCERNS AND DISADVANTAGED SMALL BUSINESS CONCERNS

If Contractor is required to utilize small business concerns or disadvantaged small business concerns by law or by contract, Trade Partner agrees to provide any information requested by Contractor that would be relevant to the issue of whether or not Trade Partner meets the criteria for these small business concerns. If required by an applicable Prime Contract, Trade Partner further agrees to comply with the obligations imposed by 13 CFR §125.9 and FAR §52.219-8, which clauses are incorporated herein by reference.

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ by:

**Firm/Company Name:**

\_\_\_\_\_

**Name of Authorized Representative:**

\_\_\_\_\_

**Signature of Authorized Representative:**

\_\_\_\_\_

**Title of Authorized Representative:**

\_\_\_\_\_

All inquiries regarding this matter should be directed to Nancy Whitworth, Equal Employment Opportunity/Affirmative Action Representative, McCown Gordon Construction, LLC, 850 Main St. Kansas City, Missouri 64105. Telephone: 816-960-1111.

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 13

### SAFETY TRAINING REQUIREMENTS

#### SAFETY REQUIREMENTS / SAFETY AND HOW IT PERTAINS TO THE TRADE PARTNER

McCownGordon Construction, LLC has established several practices involving our Trade Partners. These safety Practices are listed below. If you are a new Trade Partner, this information will be enlightening; if you are an Established Trade Partner, this information will be a review. Also, this safety attachment is by no means all encompassing as it relates to the OSHA 1926 Standards; it is merely a tool used to inform the Trade Partner and its employees of our company practices, and to avoid any misunderstanding prior or during construction as it relates to safety.

#### HEAD PROTECTION (HARD HATS)

It is the policy of McCownGordon that all personnel will wear OSHA Approved head protection while on our projects. The only exceptions to this policy are operators inside equipment that has adequate overhead protection, and tenant finish work deemed acceptable by the McCownGordon Safety representative. In most cases, if there is an overhead or side impact exposure to the individual's head, our Supervisor will require hard hats. It is a requirement that this information is conveyed to your Supervisors and employees prior to project mobilization.

#### WORK ATTIRE

All Trade Partners' employees are required to wear the appropriate work attire consisting of long pants, shirts, and work boots. Short pants, tank tops, or tennis shoes are not permissible to be worn by anyone entering the project work zone. We will also require safety glasses or the appropriate personnel protective equipment in accordance with the 1926 Standards.

#### MONTHLY MEETINGS

Each McCownGordon Project Supervisor will chair a monthly Project Specific Safety Meeting. Your Foreman and/or designated Safety Representative is required to attend these meetings.

#### FALL PROTECTION

Pursuant to the 1926 OSHA-Subpart M for fall protection, MCCOWNGORDON strongly advises all crafts working above 6' to review the performance of their work in accordance with the above standard, to plan accordingly, to enact, to establish, or to construct the proper fall protection system necessary for your scope of work. This planning should take place prior to the beginning of work. If you are not familiar with Subpart M of the 1926 Standards contact our Safety Director for assistance. This standard involves several aspects of employee training that are imperative to your business.

Steel erectors will be required to follow OSHA 1926 subpart M in lieu of subpart R when related to fall protection requirements. All workers will be tied off 100% of the time when there is a change in elevation of 6 feet or more.

Contractors using Self Retracting Lifelines (SRL) will be required to have it mounted/anchored according to manufacturing specifications. Only leading edge SRL's can be placed on the same walking/working surface as the employee. For example, setting steel with no structure above the worker or laying decking. All non-leading edge retractable's cannot be used for fall arrest unless mounted overhead per manufacturers specifications.

#### NON COMPLIANCE PROCEDURES

A practice has been established by McCownGordon concerning Trade Partners and noncompliance of the 1926 Safety Standards, as we interpret or have knowledge of them. On each project, during or after a safety inspection conducted by the Company's safety department or their designate, your supervisor or employee will be notified of any items, situations, or work practices found in noncompliance. We will request corrective action with a reasonable time frame for the compliance; said time frame will be dependent on the severity of the situation. Any severe or life threatening items or actions must be corrected immediately. In the event that the Trade Partner field supervision does not produce satisfactory results, we will contact the Trade Partner's main office and request assistance.

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 13

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### SAFETY TRAINING REQUIREMENTS

In the event that both notifications fail to correct the situation, we reserve the right to remove any employee(s) involved and/or correct the situation at the expense of the noncompliant Trade Partners.

### HAZARD COMMUNICATION STANDARD

Part of the Hazardous Communication Standard (Hazcom) requires employers on multi-employer project sites to disseminate Hazardous material information that each craft may be using to everyone on the project. This could be a large task to accomplish; therefore, we suggest to all Trade Partners that they place a copy of their company's Hazcom program with MSDS information in our project trailer. By placing their program in our possession, we can establish a common information center; but it is each company's responsibility to inform their employees of the location of the various Hazcom programs. By accepting their program, we will not take responsibility for updating, changing, reviewing, or training your employees as it relates to Hazardous materials.

### OSHA INSPECTIONS

In the event of an OSHA inspection, McCownGordon's policy does not require a warrant to enter the project site. Since 1994 the general contractor, in most instances, has been viewed as the responsible party on the project site, as far as OSHA is concerned. This theory is applied under the multi-employer worksite ruling, which means we can be fined for hazards that are created by Trade Partners even though we physically do not have employees exposed to the hazard. Therefore, we find it necessary to inform Trade Partners that if any violations are found during an OSHA inspection in which MCCOWNGORDON is cited under the multi-employer worksite ruling, we will seek financial restitution against the Trade Partner. If cooperation is received from all Trade Partners during the process of the job, then only minor citations should be found during an inspection by OSHA.

### CRANE REQUIREMENTS

Contractors will be required to comply with 1926 OSHA- Subpart CC.

Contractors utilizing cranes on McCownGordon site must submit the following documentation prior to crane mobilization: operator's CCO, operator's rigging and signal person certification, operator's crane specific evaluations, crane's annual inspection, crane's lift plan.

### DOCUMENTATION REQUIREMENTS

Prior to start of work, each trade partner must submit: site specific safety program, hazard communication program, inventory of chemicals used on jobsite, copies of safety data sheets, silica program, documentation of training specific to task / work, project orientation form, and competent person form.

Throughout the start of work, each trade partner must submit on a weekly basis: toolbox talk specific to scope of work and trade partner safety inspections.

For all high hazard work / unusual operations, a Method of Procedures form (or equivalent) must be completed and reviewed by McCownGordon.

### SAFETY GUIDELINES / REQUIREMENTS

Contractors will be required to comply with jobsite specific safety requirements and any safety rules outlined by the owner.

Contractors must conduct at least weekly site safety inspections and crew safety meetings. These items must be documented, and copies made available to McCownGordon Construction upon request.

# MASTER SUBCONTRACT AGREEMENT

## ATTACHMENT 13

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### SAFETY TRAINING REQUIREMENTS

#### THE ULTIMATE GOAL

The ultimate goal we are all trying to accomplish is to prevent injuries. Second, we are trying to limit all sources of the potential liability. We believe this can be accomplished by pre-planning, enacting a good safety program, empowering the employees to enforce the program, and communicating as a collective group of companies who are trying to construct a quality project in the safest, most efficient manner.

McCownGordon Construction, LLC has a Safety Department that any Trade Partner can contract at their convenience for assistance. The advice given by our Safety Department is as we interpret the standards or as we view the loss control issues; nevertheless, we can provide a service that might avoid employee injuries and does not cost your company money. Please take advantage of it.

Thank you for your cooperation.



**EMERGENCY CONTACT INFORMATION SHEET**

The following names and telephone numbers are required in the event of emergency and **MUST** be provided to the Contractor prior to the Trade Partner starting work on site.

Trade Partner Name: \_\_\_\_\_  
Office Contact #: \_\_\_\_\_

**Owner / Managing Partner:** \_\_\_\_\_

Home #: \_\_\_\_\_  
Mobile #: \_\_\_\_\_  
E-Mail: \_\_\_\_\_

**Project Manager:** \_\_\_\_\_

Home #: \_\_\_\_\_  
Mobile #: \_\_\_\_\_  
E-Mail: \_\_\_\_\_

**Project Foreman:** \_\_\_\_\_

Home #: \_\_\_\_\_  
Mobile #: \_\_\_\_\_  
E-Mail: \_\_\_\_\_

Please provide the name and telephone number of an individual in your firm that can be contacted in an emergency if any of the individuals listed above cannot be contacted:

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Home #: \_\_\_\_\_  
Mobile #: \_\_\_\_\_  
E-Mail: \_\_\_\_\_

\_\_\_\_\_  
Please initial to indicate receipt and acceptance

\_\_\_\_\_  
Trade Partner

\_\_\_\_\_  
Date

**ATTACHMENT 15**  
**FORM I-9**

OMB No. 1615-0047; Expires 06/30/08

Department of Homeland Security  
U.S. Citizenship and Immigration Services

**Form I-9, Employment  
Eligibility Verification**

Please read instructions carefully before completing this form. The instructions must be available during completion of this form.

**ANTI-DISCRIMINATION NOTICE:** It is illegal to discriminate against work eligible individuals. Employers CANNOT specify which document(s) they will accept from an employee. The refusal to hire an individual because the documents have a future expiration date may also constitute illegal discrimination.

**Section 1. Employee Information and Verification.** To be completed and signed by employee at the time employment begins.

|                                  |       |                |                                |
|----------------------------------|-------|----------------|--------------------------------|
| Print Name: Last                 | First | Middle Initial | Maiden Name                    |
| Address (Street Name and Number) |       |                | Apt. #                         |
| City                             |       |                | Date of Birth (month/day/year) |
| State                            |       |                | Social Security #              |
| Zip Code                         |       |                |                                |

**I am aware that federal law provides for imprisonment and/or fines for false statements or use of false documents in connection with the completion of this form.**

I attest, under penalty of perjury, that I am (check one of the following):

☐ A citizen or national of the United States

☐ A lawful permanent resident (Alien #) A \_\_\_\_\_

☐ An alien authorized to work until \_\_\_\_\_

(Alien # or Admission #)

Employee's Signature \_\_\_\_\_ Date (month/day/year) \_\_\_\_\_

**Preparer and/or Translator Certification.** (To be completed and signed if Section 1 is prepared by a person other than the employee.) I attest, under penalty of perjury, that I have assisted in the completion of this form and that to the best of my knowledge the information is true and correct.

|   |                             |
|---|-----------------------------|
| Preparer's/Translator's Signature _____                       | Print Name _____            |
| Address (Street Name and Number, City, State, Zip Code) _____ | Date (month/day/year) _____ |

**Section 2. Employer Review and Verification.** To be completed and signed by employer. Examine one document from List A OR examine one document from List B and one from List C, as listed on the reverse of this form, and record the title, number and expiration date, if any, of the document(s).

| List A                          | OR | List B | AND | List C |
|---------------------------------|----|--------|-----|--------|
| Document title _____            |    | _____  |     | _____  |
| Issuing authority: _____        |    | _____  |     | _____  |
| Document #: _____               |    | _____  |     | _____  |
| Expiration Date (if any): _____ |    | _____  |     | _____  |
| Document #: _____               |    | _____  |     | _____  |
| Expiration Date (if any): _____ |    | _____  |     | _____  |

**CERTIFICATION - I attest, under penalty of perjury, that I have examined the document(s) presented by the above-named employee, that the above-listed document(s) appear to be genuine and to relate to the employee named, that the employee began employment on (month/day/year) \_\_\_\_\_ and that to the best of my knowledge the employee is eligible to work in the United States. (State employment agencies may omit the date the employee began employment.)**

|   |                  |                             |
|---|------------------|-----------------------------|
| Signature of Employer or Authorized Representative _____  | Print Name _____ | Title _____                 |
| Business or Organization Name and Address (Street Name and Number, City, State, Zip Code) _____ |                  | Date (month/day/year) _____ |

**Section 3. Updating and Reverification.** To be completed and signed by employer.

|  |  |                                 |
|--|--|---------------------------------|
| A. New Name (if applicable) _____  | B. Date of Rehire (month/day/year) (if applicable) _____ |                                 |
| C. If employee's previous grant of work authorization has expired, provide the information below for the document that establishes current employment eligibility.   |  |                                 |
| Document Title: _____  | Document #: _____  | Expiration Date (if any): _____ |
| I attest, under penalty of perjury, that to the best of my knowledge, this employee is eligible to work in the United States, and if the employee presented document(s), the document(s) I have examined appear to be genuine and to relate to the individual. |  |                                 |
| Signature of Employer or Authorized Representative _____   |  | Date (month/day/year) _____     |

Form I-9 (Rev. 06/05/07) N

## MASTER PURCHASE AGREEMENT

This Master Purchase Agreement (this "**Agreement**") is entered into this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ by and between **McCOWNGORDON CONSTRUCTION, LLC ("Contractor")** and \_\_\_\_\_ ("**Supplier**").

**WHEREAS**, Contractor desires to purchase, and Supplier desires to supply, materials, as set forth in a Purchase Order issued pursuant to this Agreement. The Purchase Order shall contain a description of the materials and shall identify the specifications, drawings, quantities, prices, and time and place of delivery. The parties agree that the following terms and conditions shall govern and apply to all such Purchase Orders issued by Supplier to Contractor pursuant to this Agreement:

1. **TERMS OF AGREEMENT.** This Agreement, together with any Purchase Order or other document attached hereto or referenced herein shall constitute the entire agreement. Any different or additional terms of Supplier shall be of no force and effect. Supplier's electronic acceptance, acknowledgment of a Purchase Order, or commencement of performance, or delivery of materials shall constitute Supplier's acceptance of a Purchase Order.
2. **PACKING, SHIPPING.** Supplier must take all precautions in packing, crating and preservation of materials prior to shipment to minimize damage in transit and in storage and to ensure safe arrival at the destination, in accordance with the manufacturer's requirements and any further instruction by Contractor. The materials shall be packed and preserved for outdoor shipping and storage, unless otherwise directed. Each item shall be tagged or stenciled legibly and properly identified, including Supplier name and Purchase Order No. A release date will be established. No fabrication is to be started or shipments made until approval is obtained on Supplier's submittal data and Supplier has received Contractor's release. Supplier shall be the "importer of record" with respect to all materials supplied by it. On the date of shipment Supplier shall advise Contractor of: routing number, name of carrier, and estimated time of delivery. Carrier is to notify Contractor at least forty-eight (48) hours prior to delivery to facilitate unloading. Contract and Project Numbers must appear on all invoices, Bill of Lading, correspondence, and on all material packaging applying to any Purchase Order issued pursuant to this Agreement.
3. **DELIVERY. TIME OF DELIVERY IS OF THE ESSENCE.** All materials shall be delivered to Contractor F.O.B. Project Site. Supplier agrees that title to all materials will pass at the earlier of payment made to Supplier or delivery of the materials to the project site. If Supplier fails to deliver on time, Contractor may demand immediate cure, direct expedited routing (with excess costs paid by Supplier), cover at Supplier's expense or terminate the Purchase Order. Contractor shall be entitled to recover from Supplier all losses, costs and expenses incurred as a result of late delivery. If Supplier delivers materials in advance of the schedule, Contractor may, at its option, (i) return the materials at Supplier's expense for proper delivery, (ii) withhold payment until the scheduled date of delivery, or (iii) store the materials at Supplier's expense until the scheduled delivery date.
4. **SAMPLES, SHOP DRAWINGS.** Supplier shall submit all samples, shop drawings, test and other data if required and within the time set forth under each Purchase Order. In the absence of a time for submission set forth in a Purchase Order, submissions should be made by Supplier so as not to cause delay to Contractor. Nothing shall relieve Supplier from responsibility for errors therein. Contractor's approval of any such submissions shall not relieve Supplier of its obligation to furnish materials in strict accordance with this Agreement or a Purchase Order.
5. **INSPECTION.** Contractor may inspect materials at any time prior to shipment. All materials shall be subject to inspection and test prior to acceptance by Contractor at all reasonable times and places including the place of manufacture if prior to delivery. Materials shall be subject to final inspection and acceptance after delivery. Neither delivery nor inspection shall constitute acceptance thereof.
6. **INVOICING AND PAYMENT; LIEN WAIVERS.**
  - a. **For Material Purchases Above \$100,000:** Unless otherwise specified on a Purchase Order, Contractor shall pay Supplier within seven (7) days after Contractor receives payment from Owner. **TO THE FULLEST EXTENT PERMITTED BY LAW, SUPPLIER UNDERSTANDS AND AGREES THAT PAYMENT FROM OWNER TO CONTRACTOR IS AN EXPRESS CONDITION PRECEDENT TO CONTRACTOR'S OBLIGATION TO PAY SUPPLIER.** Invoices must be received by the twentieth (20<sup>th</sup>) day of each month. Provided an invoice is timely received, Contractor shall incorporate the amount approved by Contractor into Contractor's next application for payment to Owner. If Supplier's invoice (and all supporting documentation as required by Contractor) is received after the date fixed by this Section or the Purchase Order, Contractor shall incorporate the amount approved by Contractor into Contractor's next application for payment to Owner. All invoices must be submitted as outlined in the attached Accounting Requirements.
  - b. **For Material Purchases Below \$100,000:** Unless otherwise specified on a Purchase Order, Contractor shall pay Supplier 100% net forty-five (45) days from the date of Contractor's receipt of Supplier's approved and undisputed invoice, and all supporting documentation as required by Contractor, which must be submitted as outlined in Contractor's "Accounting Requirements." Payment may be delayed if Supplier does not submit invoices as outlined in Contractor's Invoicing Requirements.

Freight and sales tax must be separately itemized. Contractor may require proof of payment of Supplier's obligations. Prices are firm and not subject to increase except by a fully executed change order. All payments are contingent upon Supplier's compliance with all terms and are subject to project retainage. Contractor may offset against sums due hereunder or any other sum Supplier owes to Contractor, whether arising out of this Agreement or otherwise, including liquidated or actual damages Contractor incurs due to the fault of Supplier. **Supplier shall provide one (1) electronic copy of operation and maintenance manuals and parts lists prior to payment in excess of 50% of the purchase order price. Failure to comply with this requirement will be considered just cause for withholding payment of invoice.** Supplier shall furnish all necessary lien waivers as required to keep the Owner's premises free from liens or claims for liens arising out of the furnishing of materials on the form provided by Contractor. Contractor must be in receipt of all required documentation prior to payment of Supplier's invoice, including lien waivers.

7. **CHANGES.** Contractor may make changes to a Purchase Order at any time. If such change results in an increase or decrease in the cost of or the time required for performance, an equitable adjustment shall be made in the sole discretion of Contractor. Supplier must submit written claims for an equitable adjustment within five (5) days from Supplier's receipt of such change. No changes shall be binding on Contractor unless issued in writing by an authorized representative of Contractor and signed by both parties. Supplier shall not proceed with changes without written authorization from Contractor.
8. **WARRANTY.** In addition to any warranty in fact or implied by law, Supplier hereby expressly warrants, for one (1) year from the date of delivery, or such longer period as may be set forth in a Purchase Order or covered by the manufacturer's warranty, whichever is greater, (the "**Warranty Period**") that all

materials provided will be free from defects in design, materials and workmanship, of good quality, fit for their intended purposes and in strict accordance with all specifications. If, during the warranty period, materials are found to be defective or non-conforming, Contractor may, in Contractor's sole discretion, (1) reject and return the materials to Supplier at Supplier's expense, or (2) direct Supplier to immediately repair or replace the materials at Supplier's expense upon written demand by Contractor. Supplier's one (1) year warranty shall be extended by corrective work performed or replacement materials provided pursuant to this Section. If Supplier fails to promptly repair or replace defective or non-conforming materials within three (3) days of Contractor's written notice, Contractor may repair or replace the materials at Supplier's expense and may deduct the cost of such repair or replacement from payment otherwise due Supplier. Rejected materials shall be at Supplier's risk and expense. Supplier warrants that materials do not infringe of any patent, trademark, copyright, trade secret, or any other intellectual property rights. These warranties shall extend to Contractor, its successors, assigns, customers and users of Supplier's materials and products and Supplier shall provide directly to the ultimate end user, written evidence of these warranties, or manufacturers' warranty, as required.

9. **INSURANCE.** Supplier agrees to procure and carry, at its sole cost, (and as a condition precedent to payment), all insurance, with limits of liability and scope of coverages, as required as set forth below. All insurance policies required herein are to be written by a company duly entered and authorized to transact that class of insurance in the state where the project is located. All policies written by private carriers are to be written by carriers with an A.M. Best rating of "A-VII" or better. Contractor reserves the right to request for review certified copies of any and all insurance policies required herein. Supplier shall furnish an ACORD Form 25 Certificate of Insurance, evidencing insurance with conditions and coverage as required herein. Furnishing certificates of insurance does not obligate Contractor or its agents to approve, evaluate, or notify Supplier of its compliance or non-compliance with the requirements set forth herein. In no way shall receipt of Supplier's certificate of insurance negate, reduce, limit or waive Contractor's right to enforce the requirements herein. Contractor shall have the right to examine any policy for compliance. Supplier shall have the Certificate of Insurance completed with the Certificate Holder listed as:

McCownGordon Construction, LLC  
c/o IMA Certificate Compliance  
1705 17th Street, Suite 100  
Denver, CO 80202

- A. Trade Partner is required to register with IMA Certificate Compliance, Contractor's certificate compliance system. Trade Partner will receive a registration e-mail from [certificatecompliance@imacorp.com](mailto:certificatecompliance@imacorp.com). Follow the instructions therein to complete registration. Your broker will be required to upload a certificate on your behalf. Certificates not emailed directly from insurance brokers/agents will not be accepted. Certificates received through the mail will not be accepted. If your broker has questions, they may contact IMA directly at 303-615-7994 or at [certificatecompliance@imacorp.com](mailto:certificatecompliance@imacorp.com).
- B. Blanket Coverage: If you are working on multiple projects for McCownGordon, provide blanket coverage showing maximum limits. Please include in the description box "for any and all projects contracted with McCownGordon Construction, LLC." If your broker cannot provide a blanket certificate, Contractor will accept a certificate referencing the specific project in lieu of "any and all projects."
- C. All Suppliers shall purchase and maintain insurance as listed below:
- Commercial General Liability Insurance with minimum limits of \$1,000,000 each occurrence, \$2,000,000 general aggregate; and \$2,000,000 products and completed operations aggregate. Coverage shall include McCownGordon, the Project Owner, and their assigns, subsidiaries, affiliates, and employees as additional insured parties for both ongoing and completed operations. Coverage shall be primary and noncontributory and include a waiver of subrogation in favor of additional insured parties.
  - Umbrella Liability coverage with minimum limits of \$2,000,000 each occurrence and aggregate.
- D. In the event that Supplier or its employees or agents are required to enter onto a project or worksite of Contractor in connection with the sale of materials or equipment or the rendering of incidental services under a Purchase Order, including delivery of materials, Supplier shall, prior to entrance on the worksite or delivery of materials, purchase and maintain, in addition to insurance as required under 9.A, insurance as listed below:
- State Statutory workers' compensation coverage
  - Employer's Liability with limits not less than \$500,000 each accident/employee/policy limit
  - Automobile coverage with limits not less than \$1,000,000 per accident for bodily injury, death of any person, and property damage covering vehicles owned and non-owned used by Supplier.
- E. Special Provisions
- To the extent permitted by law, all insurance policies shall include a waiver of any right of subrogation of the insurers thereunder against McCownGordon, the Project owner, and their assigns, subsidiaries, affiliates, employees, insurers and underwriters.
  - Supplier's insurance policies shall be endorsed to provide Contractor with a 30-day Notice of Cancellation for reasons other than nonpayment of premium, and a 10-day Notice of Cancellation for the reason of nonpayment of premium. If any insurer does not make available such endorsement(s), as an alternative, Supplier's insurance agent or broker shall provide a written statement that the agent or broker will endeavor to provide the required Notices of Cancellation.
  - Supplier is required to register with IMA Certificate Compliance, Contractor's certificate compliance system. Supplier will receive a registration e-mail from [certificatecompliance@imacorp.com](mailto:certificatecompliance@imacorp.com). Follow the instructions therein to complete registration. Your broker will be required to upload a certificate on your behalf. Certificates not emailed directly from insurance brokers/agents will not be accepted. Certificates received through the mail will not be accepted. If your broker has questions, they may contact IMA directly at 303-615-7994 or at [certificatecompliance@imacorp.com](mailto:certificatecompliance@imacorp.com).
10. **INDEMNIFICATION.** Supplier shall indemnify, defend and hold harmless Contractor and Owner from and against any and all claims, damages, losses and expenses (including reasonable attorneys' fees) arising out of or resulting from Supplier's performance of services or supply of materials under this Agreement or Purchase Order or based on any breach of this Agreement or a Purchase Order.
11. **LIMITATION OF LIABILITY. NEITHER PARTY SHALL BE LIABLE FOR ANY INDIRECT, INCIDENTAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES OF ANY NATURE. CONTRACTOR'S AGGREGATE LIABILITY FOR DAMAGES OF ANY KIND ARISING OUT OF OR IN CONNECTION WITH A PURCHASE ORDER SHALL NOT EXCEED THE PURCHASE ORDER PRICE.**
12. **TERMINATION FOR DEFAULT.** Upon written notice to Supplier, Contractor may terminate this Agreement or a Purchase Order upon Supplier's default. Default includes, but is not limited to: (a) Supplier's failure to comply with this Agreement or the terms and conditions of a Purchase Order; (b) the filing of a petition

in bankruptcy, insolvency or a material adverse change in financial condition of Supplier; or (c) failure to deliver material on time. Contractor shall be entitled to recover from Supplier all losses, damages, costs and expenses incurred as a result of such default.

13. **TERMINATION FOR CONVENIENCE.** Contractor may cancel or suspend this Agreement or any Purchase Order for its convenience and without cause, upon three (3) days prior written notice to Supplier. In such event, Contractor shall pay Supplier's direct and actual costs incurred for labor and material expended on the Purchase Order up to the date of termination.
14. **DELAYS.** Supplier shall be responsible to Contractor for all damages caused by Supplier's late delivery or performance. If liquidated damages are applicable, they will be identified on the Purchase Order.
15. **GOVERNING LAW; DISPUTES.** This Agreement and any Purchase Orders issued hereunder shall be governed by the laws of the state of Missouri without regard to its conflicts of laws principles. Any claim or dispute shall be subject to mediation as a condition precedent to binding dispute resolution. The parties shall share the mediator's fee equally. The mediation shall be held in Kansas City, Missouri, unless another location is mutually agreed upon. If the parties do not resolve a claim, dispute or matter in question through mediation, the method of binding dispute resolution shall be arbitration under the Construction Industry Rules of the American Arbitration Association. Each party shall proceed with its obligations pending resolution of any dispute. The prevailing party in any binding dispute resolution shall be entitled to recover from the other party, reasonable attorneys' fees, costs and expenses incurred by the prevailing party in connection with such dispute.
16. **DESIGN RESPONSIBILITY.** If design is inherent in the materials furnished by Supplier, Supplier represents that the design will be prepared by a licensed design professional in the state where the Project is located in accordance with all laws or regulations governing the same. Supplier further agrees that such design shall be prepared in accordance with the highest standard of care for design professionals in the locality where the Project is located.
17. **MISCELLANEOUS.** Supplier shall maintain all records related to the materials supplied under any Purchase Order and any and all expenses related thereto in accordance with generally accepted accounting principles for five (5) years from the date of delivery and shall make such records available to Contractor upon request. In the event of any inconsistency between these terms and any other document, the more stringent requirement shall govern. Supplier shall not assign this Agreement or any Purchase Order without Contractor's prior written consent. All covenants, agreements, indemnities, and warranties made herein shall survive termination or expiration of this Agreement. The rights and remedies provided herein shall be cumulative and in addition to any available at law or in equity. If applicable, Supplier shall provide all MSDS sheets relevant to materials purchased. Supplier warrants that it is in full compliance with all applicable laws, including but not limited to the Fair Labor Standards Act, OSHA and EEOC.
18. **ATTACHMENTS.** the following attachments are incorporated by reference as fully as if reprinted herein and are all integral parts of this Agreement, and shall apply to any and all Purchase Orders entered into by the Parties:
  - i. Attachment 1: Example Purchase Order
  - ii. Attachment 2: Accounting Requirements
  - iii. Attachment 3: Invoicing Requirements
  - iv. Attachment 4: Partial Lien Waiver
  - v. Attachment 5: Final Lien Waiver
  - vi. Attachment 6: Materialmen List (required if Supplier is utilizing sub-suppliers)
  - vii. Attachment 7: Affidavit
  - viii. Attachment 8: EEO Requirements
  - ix. Attachment 9: Safety Requirements

IN WITNESS WHEREOF, the parties have executed this Master Purchase Agreement on the day and year first above written.

\_\_\_\_\_

McCownGordon Construction, LLC



By: \_\_\_\_\_

By: Jeff Placek

Title \_\_\_\_\_

Title: Chief Financial Officer

Date:



# Purchase Order 107XXXX-001

McCownGordon  
850 Main Street  
Kansas City, Missouri 64105  
Phone: (816) 960-1111

## Attachment 1- Example Purchase Order

Project Name Here

### PO - Scope of Supply

**DATE CREATED:**

**BILL TO:**

McCownGordon Construction, LLC  
Attn: Accounting Department  
850 Main Street  
Kansas City, MO 64105

**SHIP TO:**

Project Site Address

**CONTRACT COMPANY:**

**CREATED BY:**

**STATUS:**

**EXECUTED:**

**PAYMENT TERMS:**

**ASSIGNEE:**

**SHIP VIA:**

**DELIVERY DATE:**

**DEFAULT RETAINAGE:**

**BONDS REQUIRED:**

**OVERHEAD MARKUP:**

**TAX EXEMPT:**

**PROFIT MARKUP:**

**MASTER AGREEMENT DATE:**

**DESCRIPTION:**

**EXHIBITS:**

**ATTACHMENTS:**

Supplier is expected to fulfill all the obligations contained in the Master Purchase Agreement (the "MPA"), and, in addition, the following requirements. In the event of any inconsistency between the MPA and this Purchase Order, Supplier shall comply with the more stringent requirement.

**McCownGordon**  
850 Main Street  
Kansas City, Missouri 64105

**SUPPLIER**  
Street Address  
City, State, Zip Code

SIGNATURE

DATE

SIGNATURE

DATE



# MPA ATTACHMENT 2

## ACCOUNTING REQUIREMENTS

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### Invoicing Process:

1. Due: On or before the 20<sup>th</sup> day of the month forecasting thru the end of the month
2. Required Invoicing Supporting Documentation:
  - a. Partial Lien Waiver and Affidavit
  - b. On Final billing – Final Lien Release or if billed in full a Final is required.
  - c. Materialmen Form (if supplier has sub-suppliers)
3. Submission:
  - a. Invoice submission will be made through Procore
  - b. Refer to McCownGordon Invoicing for instruction located in the Procore Documents tab of this project.
4. Downloadable Accounting Document and Invoicing Instructions:
  - a. Procore > Project > Documents Module
  - b. Select the folder **TRADE PARTNERS**
  - c. Select the folder **001\_Accounting Forms**

### Questions:

If you have questions related to payment progress, then contact  
[SubPayables@mccowngordon.com](mailto:SubPayables@mccowngordon.com)

If you have questions related to the location of documents, then contact the Project Coordinator for this project.

NOTE: Submitting all required documents along with the Pay Application will speed up payment



# MPA ATTACHMENT 3 INVOICING REQUIREMENTS

## UNIT QUANTITY PURCHASE ORDER

**Objective:** Create an invoice as a Supplier and submit it to Contractor using the project's Commitments tool.

### Submit from Email

1. The Contractor will issue you an invitation to submit a bill, you'll receive an email notification like the one shown below.

The screenshot shows an email interface for Jackson Building. At the top, the Procore logo is visible. Below the header, there is a link 'More details: View online'. The main body of the email contains the text: 'DO NOT REPLY TO THIS EMAIL', 'This is a notification sent from an unmonitored email address.', and 'You have been invited to bill this period by Pat Project Manager for the billing period 07/01/17 - 07/31/17'. A section titled 'Requisition Details' lists the following information: Billing Period: 07/01/17 - 07/31/17, Invited By: Pat Project Manager, and Due Date: 07/13/17. Below this, a question asks 'Do you want to bill this period?' with two buttons: 'Yes' (green) and 'No' (red). At the bottom, there is another link 'More details: View online' and a footer that reads 'Powered by Procore | support@procore.com | http://support.procore.com'.

2. Under the **Do you want to bill this period?** area, choose one of the following:
  - If you want to submit the invoice, click **Yes**. Then click **Post Response** and continue with step 3.
  - OR
  - If you are not ready to submit the invoice, click **No**. Then click **Post Response**.

*Note:* If you change your mind after posting your response, you can update your response to the invitation if the 'Due Date' has not yet passed and the contractor who sent you the invitation has the 'Billing Period' set to 'Open'. To do this, click **Do you want to bill this period?** again, choose **Yes**, and then click the **Post Response** button.

3. At the Create New Invoice page in Procore, the Period Start, Period End, and Billing Date is pre-filled with what the contractor set. Enter the invoice number, if applicable.
4. In the Detail section, enter your percent complete or amount complete for each line.
5. Enter the materials presently stored amount. This will be added to the percent complete for each line item.
6. In the Approved Commitment Change Orders section, repeat the process for each change order's line items by entering the percent or amount complete for each line item. Any new approved change orders will appear at the bottom of the SOV page. You can add them by selecting each one that is approved.

# MPA ATTACHMENT 3

## INVOICING REQUIREMENTS

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7. Attach any required backup documentation, such as lien waivers.
  - If the contractor requires the Invoice to be signed, complete the following steps:
    - a. Click **Save**.
    - b. Click **Export** and select **PDF**.
    - c. Sign the PDF.
    - d. Return to Procore and select the **Summary** tab.
    - e. Click **Edit**.
    - f. Attach the signed PDF.
8. If you are not ready to submit to the contractor, click **Save**. This will set the status of the invoice to "Draft." If you are ready to submit it to the contractor, click **Submit for Review**. This will set the status of the invoice to "Under Review."  
*Note:* Once you submit the invoice to the contractor, you will not be able to edit it unless the contractor changes the status to Revise & Resubmit.

### Submit from Commitment

1. Navigate to the commitment you want to create the invoice for.
2. Click **+ Create Invoice**.
3. Complete steps #2-8 above.

### For Commitments Formatted as Unit Quantity

1. Fill out the following fields for each line items that will be paid for by the invoice:
  - **This Period (qty)**: Enter the quantity for each line item for this period and the dollar value will automatically be calculated. If you prefer to enter a percentage value for work completed instead, enter the percent and the quantity for this period and the dollar value will automatically be calculated.
2. If you need to release retainage:
  - a. Complete Steps 6 & 7 above.
  - b. Click **Save**.
  - c. In the Detail subtab, click **Edit**.
  - d. Released this Period (\$): Enter the dollar amount of retainage to be released this period.
  - e. Finish Step 8 above.
3. To save the invoice, click **Save**. To submit it for review, click **Submit for Review**.

# MPA ATTACHMENT 4

## PARTIAL LIEN WAIVER

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PROJECT NAME/NUMBER: \_\_\_\_\_

PURCHASE ORDER NUMBER: \_\_\_\_\_

McCownGordon Construction LLC, the Owner of the real estate (the "Realty") identified below, any Lender(s) having any loans secured by the Realty, and other parties, if any, having any interest in (hereinafter "Beneficiaries").

The "Realty" (Owner):

The Supplier:

The Supplier hereby applies for payment, certifies and waives all lien rights, bond rights and all other claims.

Payment Request Amount: \$ \_\_\_\_\_

Delivery Date of Material covered by payment request: \_\_\_\_\_

The Supplier, contingent upon the issuance, final clearance and payment of a valuable consideration of the sum stated above, and being familiar with the penalties for false certification, does hereby certify to the Beneficiaries that:

1. The material supplied covered by the payment request reference above, represents the actual value of material delivered under the terms of Supplier's purchase order and all authorized changes thereto .
2. Payment in full, less retainage if any, has been made by Supplier (a) to all of Supplier's sub-suppliers, equipment providers and materialmen, for all materials used or furnished by Supplier in connection with the purchase order. The Supplier warrants that it owes no monies or other things of value to any sub-supplier, materialman, person or entity for material supplied through the date of the most recent payment by McCownGordon Construction.
3. Supplier has complied with Federal, State and Local tax laws insofar as applicable to its performance of the purchase order. The undersigned has paid, or out of the proceeds of this payment will promptly pay, all sales or use tax due and owing.
4. Supplier acknowledges and agrees that it is receiving the funds paid in consideration of this Application as a trustee, and said funds will be held in trust for the benefit of all sub-suppliers and materialmen who supplied materials for which the Beneficiaries or their property might be liable, and that the Supplier shall have no interest in such funds until all these obligations have been satisfied in full.

### Partial Waiver and Release of Claims

NOW, THEREFORE, the Supplier , upon receipt of the sum of \$ \_\_\_\_\_ Check# \_\_\_\_\_ for all materials supplied through \_\_\_\_\_ (date) irrevocably and unconditionally releases and waives any and all mechanic's liens or other liens or rights to claim any and all mechanic's liens or other liens against the Realty, except as it pertains to unpaid retainage. The undersigned waives and releases any other claims against the Owner, the property or McCownGordon Construction LLC, its sureties on any bonds, or any other claims of any kind whatsoever in connection with this Purchase Order. The undersigned shall indemnify and hold the Beneficiaries and their respective successors and assigns harmless against any lien, bond, claims or suits in connection with the materials supplied and everything else in connection with this Purchase Order.

# MPA ATTACHMENT 4 PARTIAL LIEN WAIVER

---

Supplier: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

State of \_\_\_\_\_

County of \_\_\_\_\_

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned, personally appeared \_\_\_\_\_, \_\_\_\_\_ of he/she executed \_\_\_\_\_, known to me to be the person who executed this document and acknowledged to me that the same for the purposes therein stated.

\_\_\_\_\_  
Notary Public in and for said County and State

\_\_\_\_\_  
Commission Expires

# MPA ATTACHMENT 5 FINAL LIEN WAIVER

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To: McCownGordon Construction LLC, the Owner of the real estate (the "Realty") identified below, any Lender(s) having any loans secured by the Realty, the Applicant's Contractor (if not the General Contractor) and other parties, if any, having any interest in (hereinafter collectively the "Beneficiaries").

The "Realty": \_\_\_\_\_

The undersigned hereby applies for payment, certifies and waives lien rights, bond rights and all other claims.

Payment Request Amount: \$ \_\_\_\_\_ by \_\_\_\_\_  
(Supplier Name)

Date of last work covered by payment request: \_\_\_\_\_  
Certificate

The undersigned, contingent upon the issuance, final clearance and payment of a valuable consideration of the amount stated above, and being familiar with the penalties for false certification, does hereby certify to the Beneficiaries that:

1. The amount requested for labor performed and equipment and material supplied on this Project or in connection with the Property reference above, represent the actual value of work accomplished under the terms of the undersigned's agreement and all authorized changes thereto concerning work to be performed on the Realty (hereinafter the "Contract").
2. No labor, equipment or materials have been supplied under contracts or agreements with the undersigned, either verbal or written, or any arrangements of any type whatsoever.
3. Payment in full has been made by the undersigned through the period covered by all prior payments (a) to all of the undersigned's sub-tier contractors, equipment providers, materialmen and laborers, and (b) for all materials and labor used or furnished by the undersigned in connection with the performance of the Contract. The undersigned represents and warrants that it owes no monies or other things of value to any sub-tier contractor, materialman, person or entity for work performed or material supplied through the date of the most recent payment by Owner, and that the payments that have been or will be made out of this final payment to such persons or firms will fully and completely compensate them for all work in connection with the Project.
4. The undersigned has complied with Federal, State and Local tax laws, including, without limitation, Income Tax Withholding, Sales Tax, Fringe Benefits owed pursuant to collective bargaining agreements, Social Security, Unemployment Compensation and Worker's Compensation laws, insofar as applicable to the performance of the contract.
5. The undersigned acknowledges and agrees that it is receiving the funds paid in consideration of this Application as a trustee, and said funds will be held in trust for the benefit of all sub-tier contractors, materialmen, suppliers and laborers who supplied work for which the Beneficiaries or their property might be liable, and that the undersigned shall have no interest in such funds until all these obligations have been satisfied in full.

## Final Waiver and Release of Claims

NOW, THEREFORE, the undersigned acknowledges receipt of prior payments in the sum of \$ \_\_\_\_\_ (Payments to date), and contingent upon receipt of the sum of \$ \_\_\_\_\_ (final payment) for all work completed through date of waiver for which the undersigned irrevocably and unconditionally releases and waives any and all mechanic's liens or other liens or right to claim any and all mechanic's liens or other liens against the Realty. Additionally, the undersigned waives and releases any other claims against the Owner, the property or McCownGordon Construction LLC, its sureties on any bonds, or any other claims of any kind whatsoever in connection with this Contract and with the Realty.

# MPA ATTACHMENT 5 FINAL LIEN WAIVER

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The undersigned shall indemnify and hold the Beneficiaries and their respective successors and assigns harmless against any lien, bond, claims or suits in connection with the materials, labor, and everything else in connection with this Contract.

Supplier: \_\_\_\_\_

By: \_\_\_\_\_

Title: \_\_\_\_\_

Date: \_\_\_\_\_

State of \_\_\_\_\_

County of \_\_\_\_\_

On this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, the undersigned, personally appeared \_\_\_\_\_, known to me to be the person who executed this document and acknowledged to me that he/she executed the same for the purposes therein stated.

\_\_\_\_\_  
Notary Public in and for said County and State

\_\_\_\_\_  
Commission Expires

McCownGordon PROJECT NUMBER : \_\_\_\_\_

McCownGordon PROJECT NAME : \_\_\_\_\_

Supplier FIRM: \_\_\_\_\_

850 Main St.  
Kansas City, Missouri 64105

McCownGordon Project Name/No: \_\_\_\_\_

Subcontractor Name: \_\_\_\_\_

Progress Invoice No: \_\_\_\_\_

Progress Invoice Date: \_\_\_\_\_

- ☐ Check here if you are using Sub-Tier Contractors, Equipment Lessors and / or Materialmen on this project  
The following is a list of all of the Sub-tier, Equipment Lessors and Materialmen which are being utilized on this project with the approximate dollar amount for the purchase. A Partial and /or Final Lien Waiver is required from any Sub-Tiers, Equipment Lessors or Materialmen that have a contract amount  $\geq$  \$20,000.00. Failure to provide this required documentation will result in the Payment Application being rejected by McCownGordon.

| COMPANY NAME  | COMPANY ADDRESS | PHONE           | CONTRACT AMOUNT (\$) | PAID TO DATE   | REQUISITION<br>AMOUNT THIS<br>APPLICATION | BALANCE |
|---|-----------------|-----------------|----------------------|--|---|---------|
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
| COMPLETE THE SECTION BELOW FOR ALL TEMPORARY EQUIPMENT & SCAFFOLDING BROUGHT TO THE PROJECT SITE. |                 |                 |                      |  |   |         |
| COMPANY NAME  | EQUIPMENT TYPE  | MAKE /<br>MODEL | SERIAL NUMBER        | RENTED or OWNED<br>If Equip. is Rented<br>please attach a copy<br>of the Lien Waiver<br>from the Rental<br>Company | NAME OF RENTAL COMPANY                    |         |
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
|   |                 |                 |                      |  |   |         |
| PLEASE CONTINUE ON TO A SECOND PAGE IF<br>NEEDED.   |                 |                 |                      |  |   |         |

To be approved by McCown Gordon Construction prior to payment

Project Manager Approval: \_\_\_\_\_

Date: \_\_\_\_\_

Project Accountant: \_\_\_\_\_

Date: \_\_\_\_\_

Note: This Sub-tier, Equipment Lessor and Materialmen list should be attached with all progress invoices irrespective of whether Sub tier contractors and Materialmen are being utilized or not

# MPA ATTACHMENT 7 AFFIDAVIT FORM

## AFFIDAVIT

STATE OF \_\_\_\_\_}

COUNTY OF \_\_\_\_\_}

\_\_\_\_\_ being duly sworn on his oath deposes and says: that he/she \_\_\_\_\_  
(Owner / Officer) (Title)

of the \_\_\_\_\_, a Supplier of \_\_\_\_\_  
(Company Name) (Materials Provided)

on the \_\_\_\_\_ located at \_\_\_\_\_;  
(Project Title) (Project Address)

Certifies that he is familiar with the provisions for penalties for false certification; that all bills for material or other things of value including, but not limited to, sales tax, withholding taxes, social security taxes, unemployment taxes and fringe benefits furnished by or through them before the date of \_\_\_\_\_ under the Purchase Order with McCownGordon Construction, LLC have been fully paid, settled and satisfied; that the companies and parties listed on the Materialmen List are the only material sub-suppliers for this job (if any) for the materials delivered on (insert date) \_\_\_\_\_; that it understands that McCownGordon Construction, LLC, or anyone on their behalf may and will act and rely upon this instrument in releasing any funds due or owing Supplier.

McCownGordon Construction, LLC relies totally on the accuracy of Supplier with respect to the names of the sub-suppliers and their respective amounts due. If, after final payment has been made in good faith to Supplier, and any additional claims, invoices, bills or liens are presented for unpaid materials or equipment, Supplier agrees to indemnify and release McCownGordon Construction, LLC from any liability associated with said claims, invoices, bills or liens.

Supplier further certifies that it is registered to do business within the State of this project.

Subscribed, and sworn before me, \_\_\_\_\_ this \_\_\_\_\_, day of \_\_\_\_\_.  
(Month/Year)

By: \_\_\_\_\_  
(Supplier Representative)

Title: \_\_\_\_\_

Notary: \_\_\_\_\_

My Commission Expires: \_\_\_\_\_

PROJECT NUMBER / NAME: \_\_\_\_\_

SUPPLIER NAME: \_\_\_\_\_

PURCHASE ORDER NUMBER: \_\_\_\_\_



# MPA ATTACHMENT 8

## EEO REQUIREMENTS

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Supplier shall comply with all laws protecting the rights of its employees and potential employees, including Equal Employment Opportunity laws (specifically, Executive Order 11246 September 24, 1965) and to K.S.A. 44-1030. Unless exempted by rules, regulations, or orders of the Secretary of Labor, issued pursuant to Section 204 of the Executive Order, Supplier specifically agrees as follows:

(1) Supplier will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. Supplier will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates or pay or other forms of compensation; and selection for training, including apprenticeship. Supplier agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth its provisions of this nondiscrimination clause.

(2) Supplier will, in all solicitations or advertisements for employees placed by or on behalf of Supplier, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

(3) Supplier will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer, advising the labor union or worker's representative of Supplier's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) Supplier will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

Pursuant to K.S.A. 44-1030, Supplier specifically agrees as follows:

(1) Supplier shall observe the provisions of the Kansas Act Against Discrimination and shall not discriminate against any person in the performance of work under the Subcontract because of race, religion, color, sex, disability, national origin or ancestry;

(2) in all solicitations or advertisements for employees, Supplier shall include the phrase, "equal opportunity employer," or a similar phrase to be approved by the Kansas human rights commission;

(3) if Supplier fails to comply with the manner in which Supplier reports to the Kansas human rights commission in accordance with the provisions of K.S.A. 44-1031 and amendments thereto, Supplier shall be deemed to have breached the Subcontract and it may be canceled, terminated or suspended, in whole or in part, by MGCC or the contracting agency; and

(4) if Supplier is found guilty of a violation of the Kansas act against discrimination under a decision or order of the commission which has become final, Supplier shall be deemed to have breached the Subcontract and it may be canceled, terminated or suspended, in whole or in part, by McCownGordon or the contracting agency.

### EEO COMPLIANCE CERTIFICATE

Supplier certifies to McCownGordon Construction LLC ("Contractor") that throughout the period covered Supplier will comply with all applicable provisions of Executive Order 11246 as revised from time to time and as implemented by Title 41 of the Code of Federal Regulations, particularly Chapters 1, 50 and 60, as the same may be amended from time to time.

Supplier further certifies and agrees that each of the following provisions is made a part of each subcontract between Supplier and Contractor, entered, unless, and to the extent that, because of dollar amount or otherwise, the subcontract is not required to contain the provision:

#### I. NON-DISCRIMINATION IN EMPLOYMENT

(a) The Supplier will recruit and hire employees who are disabled veterans, Vietnam era veterans, and individuals with handicaps and will not discriminate against any employee or applicant for employment because of race, color, religion, sex or national origin. The Supplier will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to status such as disabled veterans, Vietnam era veterans, handicapped individuals or because of race, color, religion, sex or national origin. Such action shall include, but not be limited to, the following employment, upgrading demotion, or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. The Supplier agrees to post in

# MPA ATTACHMENT 8

## EEO REQUIREMENTS

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conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this non-discrimination clause.

(b) The Supplier will, in all solicitations or advertisements for employees placed by or on behalf of the Supplier, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

(c) The Supplier will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract of understanding, a notice to be provided by the agency contracting officer, advising the labor union or worker's representative if the Supplier's commitments under Equal Opportunity Clause, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(d) The Supplier will comply with all provisions of Executive Order 11246 of September 24, 1965, and the rules, regulations and relevant orders of the Secretary of Labor.

(e) The Supplier will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders.

(f) In the event of the Supplier's noncompliance with the Equal Opportunity Clause of this subcontract or with any part of such rules, regulations or orders, this subcontract may be canceled, terminated or suspended in whole or in part and the Supplier may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rules, regulations or orders of the Secretary of Labor, or as otherwise provided by law.

(g) The Supplier will include the provisions of paragraphs (a) through (g) in every subcontract unless exempted by rules, regulations or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provision will be binding upon each Supplier or vendor. The Supplier will take such action with respect to any subcontract as the contracting agency may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event the Supplier becomes involved in, or is threatened with litigation with a Supplier or vendor as a result of such direction by the contracting agency, the Supplier may request the United States to enter into such litigation to protect the interests of the United States.

### II. CERTIFICATION OF NONSEGREGATED FACILITIES

Supplier does not, and during the performance of each subcontract with Contractor, will not maintain or provide for his employees and segregated facilities at any of his establishments, and does not and will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. Supplier agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this certificate. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color or national origin, because of habit, local custom or otherwise. He further agrees that (except where he has obtained identical certifications from proposed Suppliers for specific time periods) he will obtain identical certifications from proposed Suppliers prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause; that he will retain such certifications in his files, and that he will forward the following to such proposed Suppliers (except where the proposed Suppliers have submitted identical certifications for specific time periods): NOTICE TO PROSPECTIVE SUPPLIERS OF REQUIREMENT FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES. A Certification of Nonsegregated Facilities, as required by Chapter 60-1.8 of Title 41 of the Code of Federal Regulations must be submitted prior to the award of a subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semi-annually or annually).

NOTE: Whoever knowingly or willfully makes any false, fictitious or fraudulent representations may be liable for criminal prosecutions under 18 U.S.C. 1001.

### III. FILING CERTIFICATE

Supplier has failed or will file the necessary compliance reports, including Standard Form 100 (EEO-1) where and when required by law and

# MPA ATTACHMENT 8

## EEO REQUIREMENTS

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applicable regulations, including, without limitation, the Civil Rights Act of 1964 as amended by the Equal Employment Opportunity Act of 1972 and regulations in 41 CFR 60-1.7. Supplier has required and will require similar certification and filing from its non-exempt suppliers.

#### IV. AFFIRMATIVE ACTION CERTIFICATE

Supplier has developed, is maintaining and will continue to maintain the written affirmative action compliance program to guarantee equal employment opportunity to minority groups required by applicable law and regulations, including, without limitation, those appearing in 41 CFR 60-1.40. Supplier has required and will require similar certification from each of its non-exempt suppliers.

#### V. UTILIZATION OF SMALL BUSINESS CONCERNS AND DISADVANTAGED SMALL BUSINESS CONCERNS

If Contractor is required to utilize small business concerns or disadvantaged small business concerns by law or by contract, Supplier agrees to provide any information requested by Contractor that would be relevant to the issue of whether or not Supplier meets the criteria for these small business concerns. If required by an applicable Prime Contract, Supplier further agrees to comply with the obligations imposed by 13 CFR §125.9 and FAR §52.219-8, which clauses are incorporated herein by reference.

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ by:

**Firm/Company Name:** \_\_\_\_\_

**Name of Authorized Representative:** \_\_\_\_\_

**Signature of Authorized Representative:** \_\_\_\_\_

**Title of Authorized Representative:** \_\_\_\_\_

All inquiries regarding this matter should be directed to Nancy Whitworth, Equal Employment Opportunity/Affirmative Action Representative, McCown Gordon Construction, LLC, 850 Main St. Kansas City, Missouri 64105. Telephone:816-960-1111.

# MPA ATTACHMENT 9

## SAFETY REQUIREMENTS

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### INTRODUCTION

McCownGordon Construction, LLC ("Contractor") has established several safety practices involving our Subcontractors. These are listed below. If you are a new Subcontractor, this information will be enlightening; if you are an established Subcontractor, this information will be a review. This attachment is not all-encompassing as it relates to the OSHA 1926 Standards. Rather, it is a tool to inform you and your employees of our company policies as they relate to safety, to avoid any misunderstanding prior or during construction.

### HEAD PROTECTION (HARD HATS)

Contractor requires that all personnel wear OSHA Approved head protection while on our project sites. The only exceptions to this policy are operators inside equipment that has adequate overhead protection, and tenant finish work deemed acceptable by the McCownGordon Safety representative. In most cases, if there is an overhead or side impact exposure to the individual's head, our Supervisor will require hard hats. It is a requirement that this information is conveyed to your Supervisors and employees prior to project mobilization.

### WORK ATTIRE

Subcontractors' employees are required to wear appropriate work attire consisting of long pants, shirts, and work boots. Shorts, short pants, tank tops and tennis shoes are not allowed to be worn by anyone entering the project work zone. Safety glasses or the appropriate personnel protective equipment in accordance with the 1926 Standards are also required.

### FALL PROTECTION

Pursuant to the 1926 OSHA-Subpart M for fall protection, Contractor strongly advises all crafts working above 6' to review the performance of their work in accordance with the above standard, to plan accordingly, to enact, establish, or construct the proper fall protection system necessary for your scope of work. This planning should take place prior to starting work. If you are not familiar with Subpart M of the 1926 Standards contact our Safety Director Brian Schrader ([bschrader@mccowngordon.com](mailto:bschrader@mccowngordon.com)) for assistance. This standard involves several aspects of employee training that are imperative to your work.

Steel erectors are required to follow OSHA 1926 subpart M in lieu of subpart R when related to fall protection requirements. All workers will be tied off 100% of the time when there is a change in elevation of 6 feet or more.

Subcontractors using Self Retracting Lifelines (SRL) are required to mount/anchor according to manufacturing specifications. Only leading edge SRL's can be placed on the same walking/working surface as the employee. For example, setting steel with no structure above the worker or laying decking. All non-leading edge retractable's cannot be used for fall arrest unless mounted overhead per manufacturers specifications.

### NON-COMPLIANCE

On each project, during or after a safety inspection conducted by Contractor's safety department or their designate, your supervisor or employee will be notified of any items, situations, or work practices that fail to comply with the 1926 Safety Standards, as we interpret or have knowledge of them. Upon discovery of such non-compliance, Contractor will request corrective action within a reasonable time, under which Subcontractor must bring the non-compliant item, situation or work practice into compliance, to Contractor's approval. Such reasonable time will depend on the severity of the situation. Severe or life-threatening situations must be

# MPA ATTACHMENT 9

## SAFETY REQUIREMENTS

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corrected immediately. In the event that the Subcontractor field supervision does not produce satisfactory results, we will contact the Subcontractor's main office and request assistance. In the event that both notifications fail to correct the situation, Contractor reserves the right to remove the employee(s) involved and/or correct the situation at Subcontractor's expense.

### HAZARD COMMUNICATION STANDARD

The Hazardous Communication Standard (Hazcom) requires that employers on multi-employer project sites disseminate Hazardous material information that each craft may be using to everyone on the project. Contractor requires that all Subcontractors upload a copy of their company's Hazcom program with SDS information in our project trailer. By doing so, we can establish a common information center; but it each Subcontractor remains responsible for informing their employees of the location of the various Hazcom programs. Contractor does not take any responsibility for updating, changing, reviewing, or training Subcontractor's employees as it relates to such Hazardous material information.

### AIR CONTAMINANTS AND MONITORING

When powered equipment, other than electrical, is utilized inside an enclosed area, continuous air monitoring must occur, and documentation of air results must be maintained and submitted to Contractor on a daily basis. This includes the operation of equipment such as diesel-powered welding machines, gas generators, diesel-powered forklifts, chop saws, etc. Each Subcontractor and its sub-tier contractors are responsible for providing such air monitoring.

There shall be NO "dry" cutting, grinding, large bore drilling of concrete, CMU or other silica containing material. All dust containing silica must be collected in accordance with applicable NIOSH, ANSI, OSHA and governing Authorities having jurisdiction.

Subcontractor and its sub-tier contractors are responsible for ensuring any operations generating dust shall use necessary means to control the dust and minimize and/or eliminate exposures. This includes haul roads, grinding, drilling, chipping, hammering, sawing, polishing, cutting operations, etc.

Subcontractors and sub-tier contractors will be responsible for ensuring appropriate PPE for any exposures or supply the Contractor with Negative Exposure Assessments confirming exposure limits are below those established by OSHA, NIOSH, EPA or other governing authorities for the specific exposure. This includes, but is not limited to, nuisance dust and silica from operations, drilling and cutting operations, metal fume and hexavalent chromium from hot work operations, etc.

Nuisance Dust in individual employee work locations; Subcontractors and its subcontractors will be responsible for ensuring that any operations generating dust shall use necessary means to control the dust and minimize or remove exposures. The GC/CM reserves the right to require the employer of an employee to perform additional air monitoring, if the GC/CM determines additional air monitoring is recommended. When applicable, sweeping compound shall be used to control nuisance dust from daily sweeping of working surfaces.

If required by the Prime Contract, all Subcontractors and their sub-tier contractors must be certified for renovation, repair, and painting as required in the EPA RRP Lead Base Paint regulation.

All workers are required to use Lead Safe Methods and be certified (and must provide such certifications to

# MPA ATTACHMENT 9

## SAFETY REQUIREMENTS

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Contractor) when working around painted surfaces that are pre-1973. Adherence to OSHA 29 CFR 1926.16 will be required by all Subcontractors and their sub-tier contractors. All Subcontractors are responsible for training their employees as specified under OSHA 29 CFR 1926.62.

### OSHA INSPECTIONS

In the event of an OSHA inspection, Contractor's policy does not require a warrant to enter the project site. Since 1994 the general contractor, in most instances, has been viewed as the responsible party on the project site, as far as OSHA is concerned. This theory is applied under the multi-employer worksite ruling, which means we can be fined for hazards that are created by Subcontractors even though we physically do not have employees exposed to the hazard. Therefore, we find it necessary to inform Subcontractors that if any violations are found during an OSHA inspection in which Contractor is cited under the multi-employer worksite ruling, we will seek financial restitution against the Subcontractor.

### CRANE REQUIREMENTS

Contractors will be required to comply with 1926 OSHA- Subpart CC. Contractors utilizing cranes on McCownGordon site must submit the following documentation prior to crane mobilization: operator's CCO, rigging and signal person certifications from all employees performing these job duties, operator's crane specific evaluations, crane's annual inspection, crane lift plan, etc. Contractor reserves the right to ask for additional third-party crane inspection, especially when critical picks are being conducted.

### DOCUMENTATION REQUIREMENTS

Prior to start of work, each Subcontractor must submit: a site-specific safety program, a hazard communication program, inventory of chemicals/hazardous materials to be used on jobsite, copies of safety data sheets, a silica program for contractors using or working with silica materials, documentation of training specific to task/work, a project orientation form, and a competent person form. Subcontractor must submit a toolbox talk specific to its scope of work and Subcontractor safety inspections on a weekly basis throughout the duration of its work. For high hazard work and unusual operations, a Method of Procedures form (or equivalent) must be completed by Subcontractor.

### MISSOURI SAFETY TRAINING REQUIREMENTS

If the Project is a public works project in the State of Missouri, Subcontractor and its sub-tier contractors must provide a 10-hour OSHA construction safety program or similar program approved by the Missouri Department of Labor and Industrial Relations. Such program must be completed on site by all employees within sixty (60) days of beginning work on the Project, pursuant to Section 292.675, Revised Statutes of Missouri. Subcontractors and its sub-tier contractors that fail to comply with this requirement will pay to the public owner a \$2,500 fine, plus \$100 per day for each day, per employee without training. Owner and Contractor may withhold such penalties from payments due to Subcontractor. To ensure compliance with this requirement, Subcontractor and its sub-tier contractors will be required to provide such training and complete an affidavit attesting to its compliance as required by statute.

### SAFETY GUIDELINES/REQUIREMENTS

Subcontractors are required to comply with jobsite specific safety requirements and programs, and any safety rules outlined by the Owner. Subcontractors must conduct site safety inspections and crew safety meetings, at

# MPA ATTACHMENT 9

## SAFETY REQUIREMENTS

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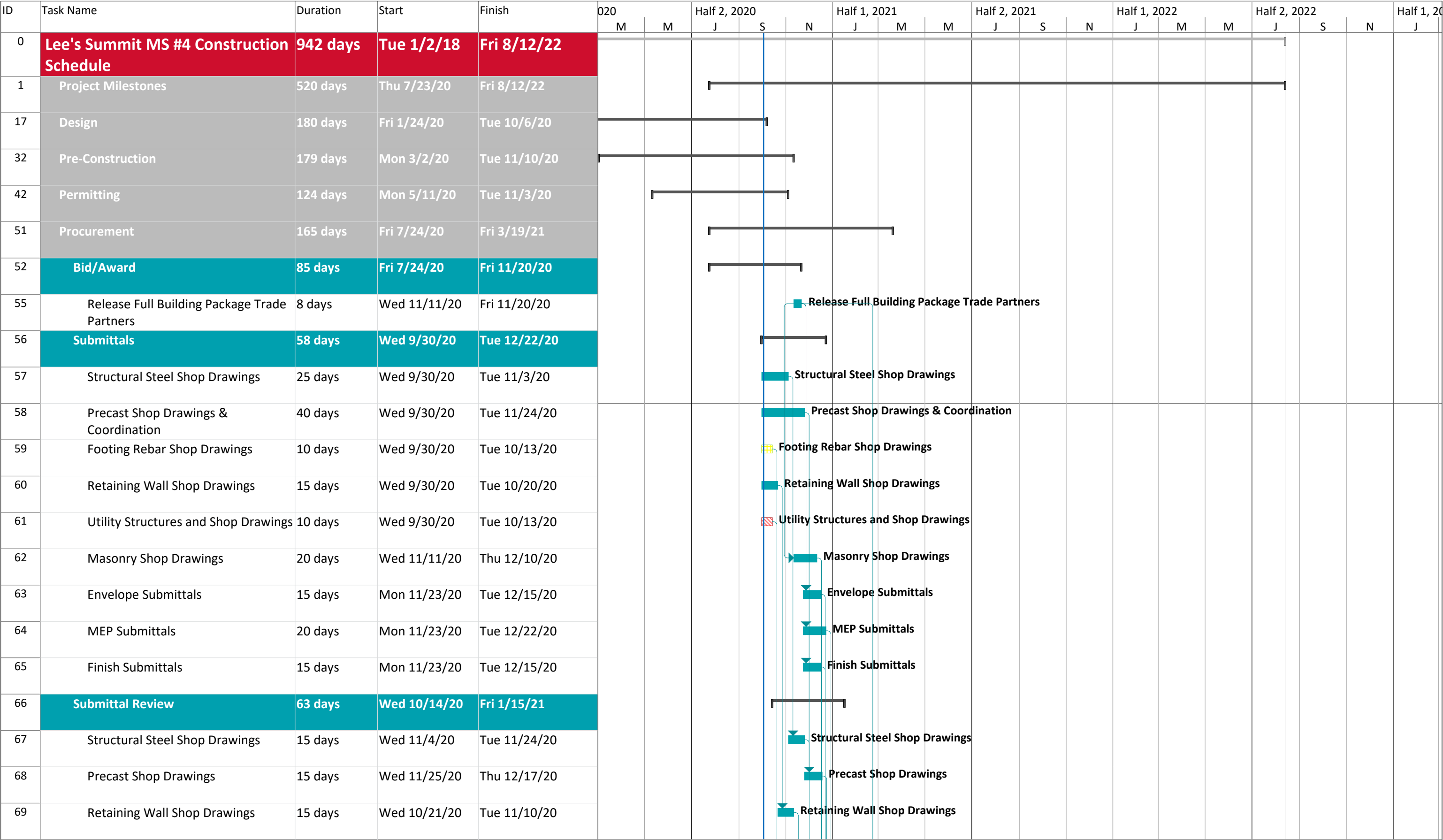
least once per week. These inspections and meetings must be documented, and copies of such documentation must be made available to Contractor upon request.

### THE ULTIMATE GOAL

Of upmost importance is injury prevention and to limit sources of potential liability. This can be accomplished by planning ahead, enacting a high caliber safety program, empowering employees to enforce the program, and communicating collaboratively together, so that we can construct a quality project in the safest, most efficient manner.

Subcontractor can contact McCownGordon Construction's Safety Department at its convenience for assistance. The advice given by our Safety Department is as we interpret the standards or as we view the loss control issues. This service is free of cost and exists to help reduce employee injuries. Please feel free to reach out at any time with questions.

We thank you for your cooperation.

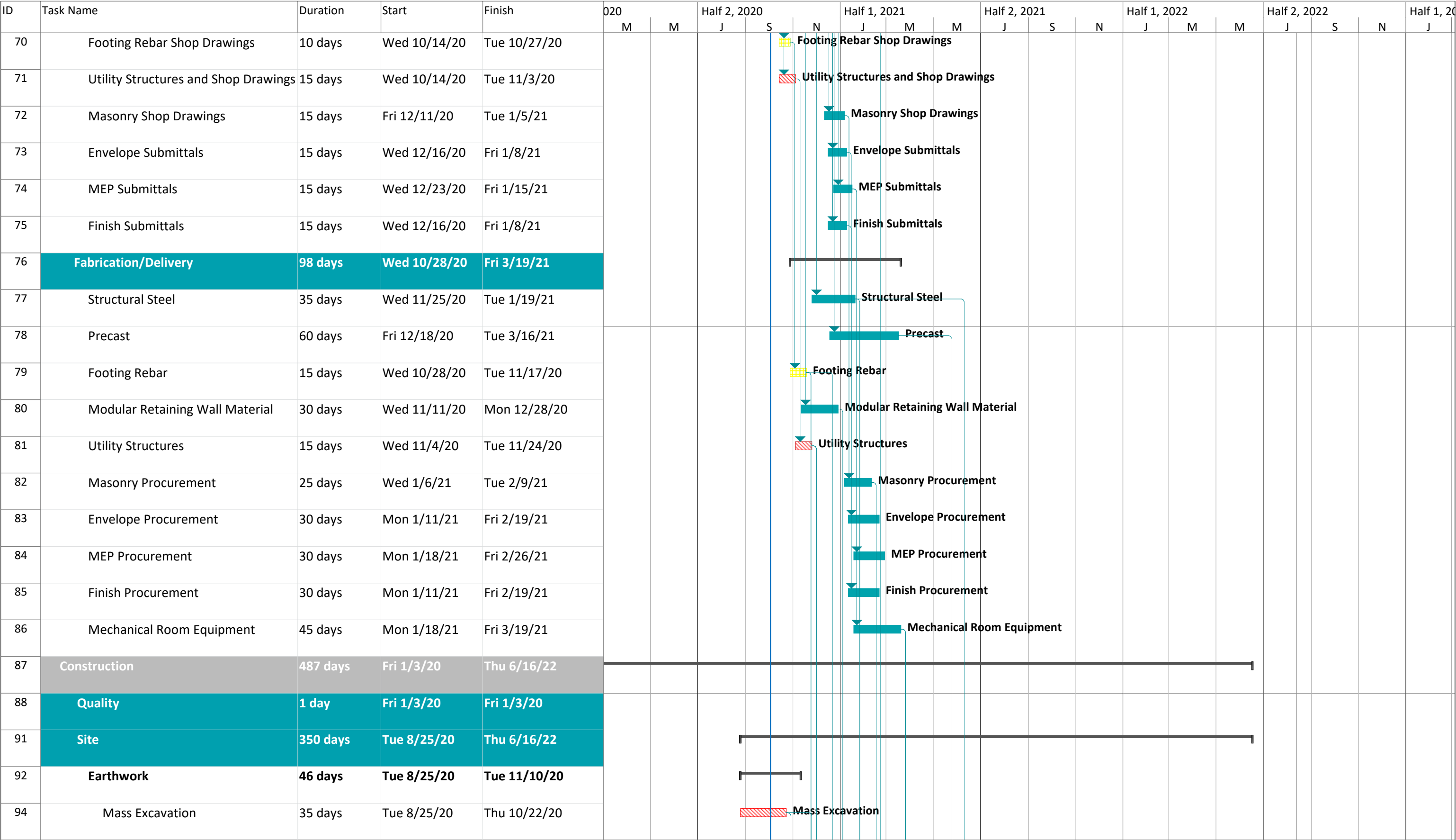


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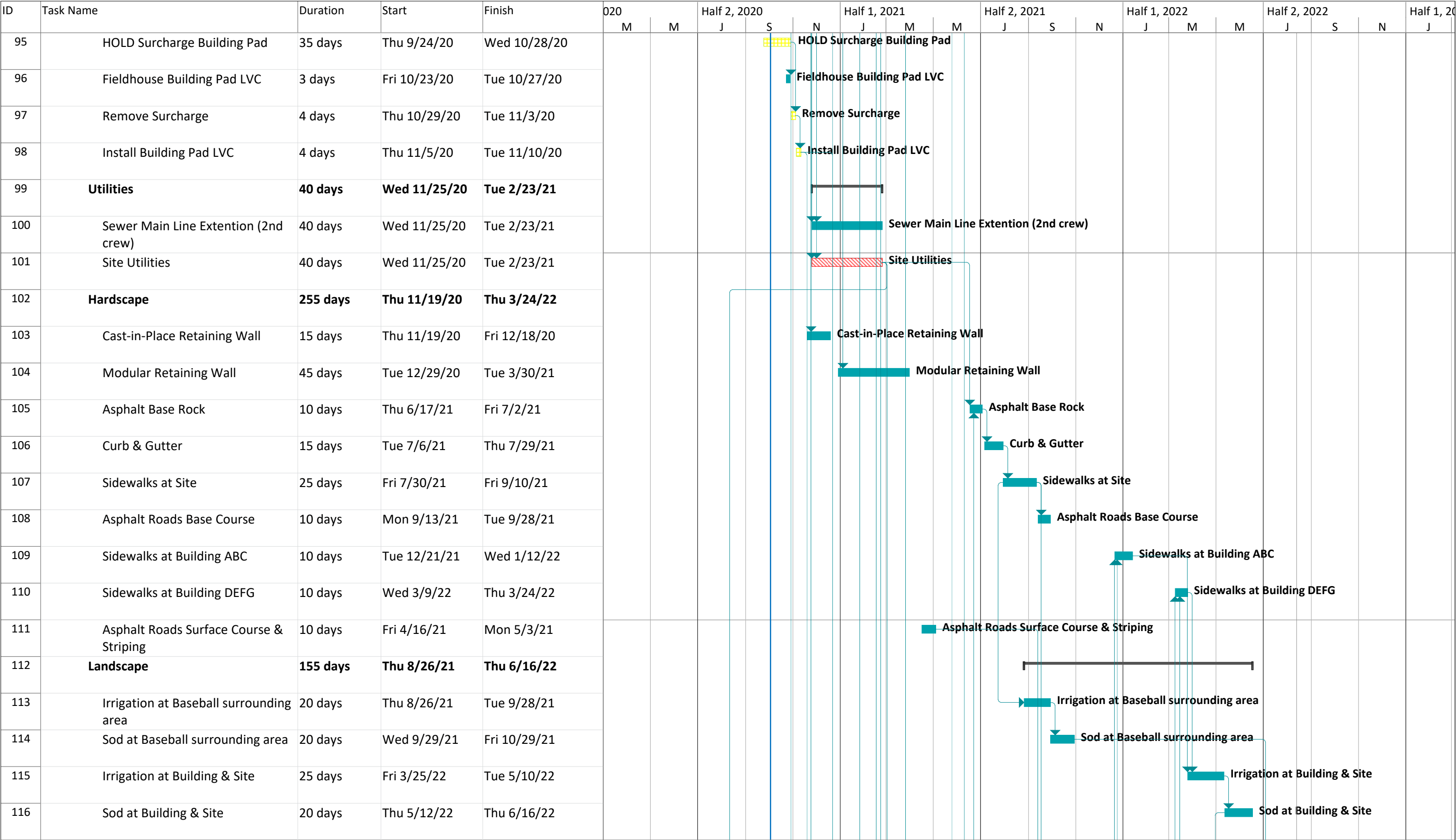




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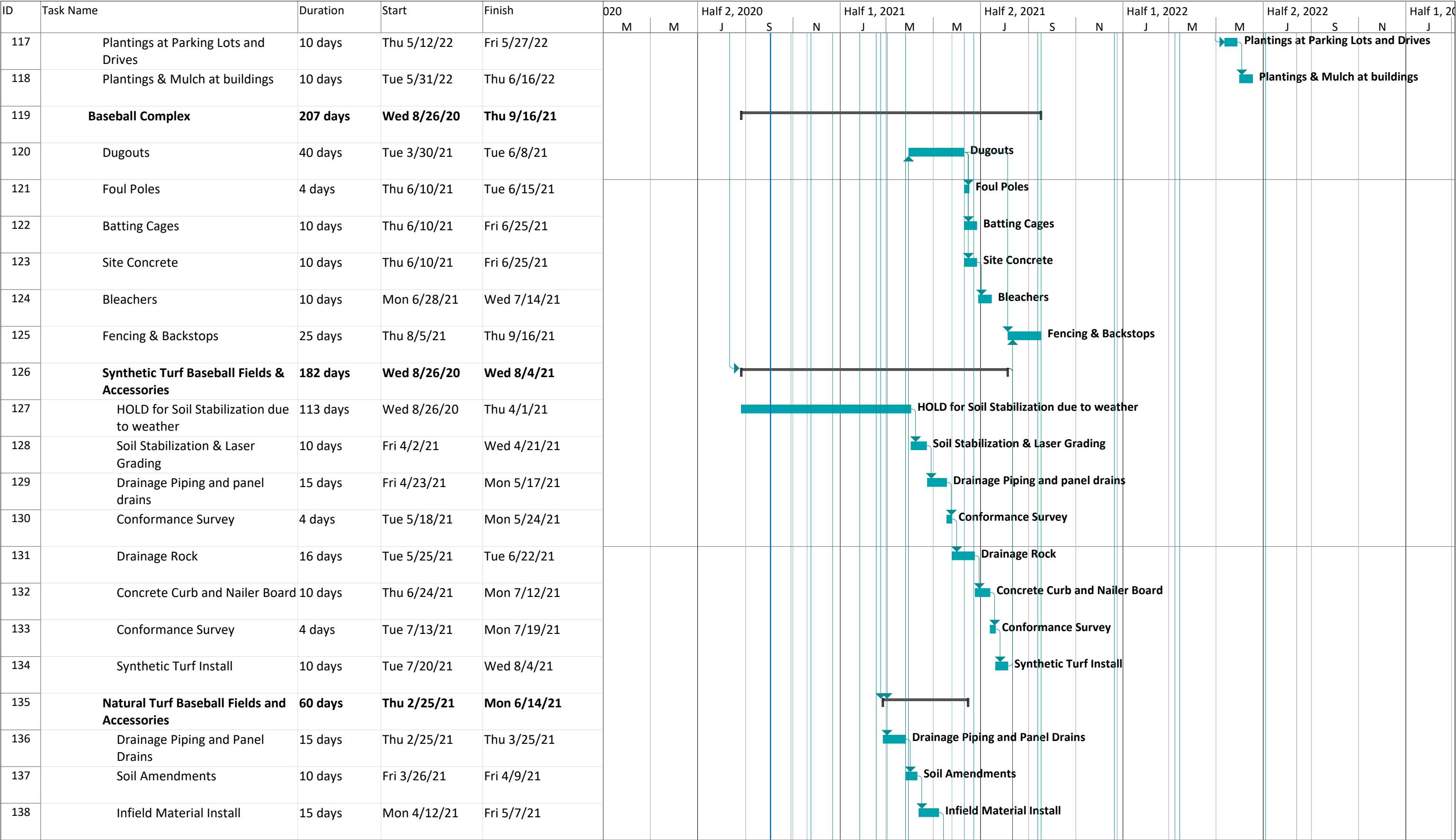
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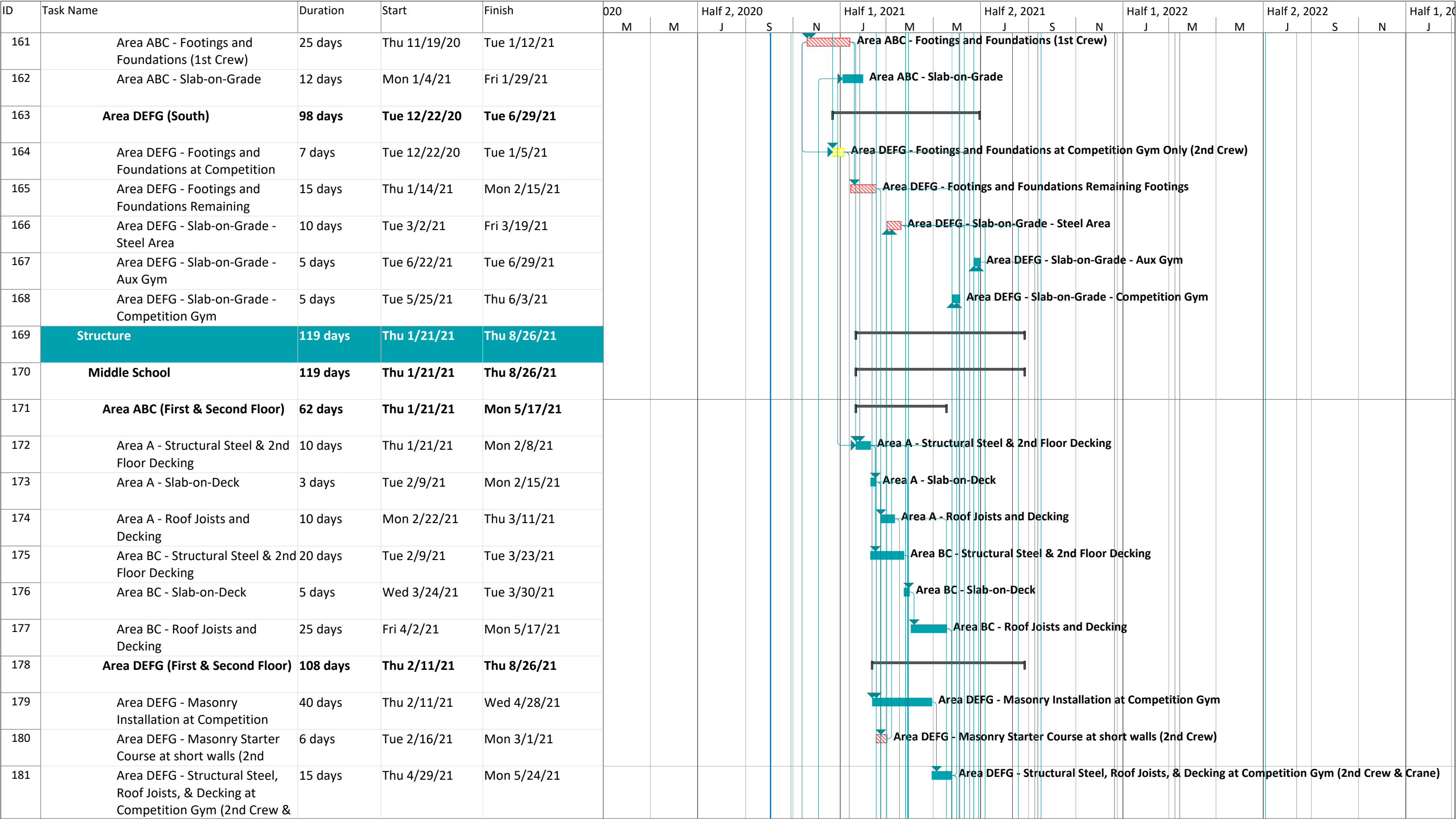
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| ID  | Task Name                                  | Duration | Start        | Finish      | 020 |   | Half 2, 2020 |   |   | Half 1, 2021 |   |   | Half 2, 2021 |   |   | Half 1, 2022 |   |   | Half 2, 2022 |   |   | Half 1, 2023 |
|-----|--|----------|--------------|-------------|-----|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|
|     |  |          |              |             | M   | M | J            | S | N | J            | M | M | J            | S | N | J            | M | M | J            | S | N |              |
| 139 | Outfield Material Install                  | 20 days  | Mon 5/10/21  | Mon 6/14/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 140 | Football & Track Complex                   | 52 days  | Thu 2/25/21  | Fri 5/28/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 141 | Football & Practice Field                  | 52 days  | Thu 2/25/21  | Fri 5/28/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 142 | Finish Grade & Laser Grade                 | 10 days  | Thu 2/25/21  | Tue 3/16/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 143 | Drainage & Backfill                        | 10 days  | Thu 3/18/21  | Thu 4/1/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 144 | Irrigation at Football & Practice Field    | 15 days  | Fri 4/2/21   | Thu 4/29/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 145 | Sod Install                                | 1 day    | Fri 5/28/21  | Fri 5/28/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 146 | Track and Field & Accessories              | 51 days  | Thu 2/25/21  | Thu 5/27/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 147 | Track Laser Grading and Soil Stabilization | 5 days   | Thu 2/25/21  | Thu 3/4/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 148 | Track Base Rock                            | 3 days   | Fri 3/5/21   | Thu 3/11/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 149 | Track Curbs                                | 10 days  | Fri 3/12/21  | Tue 3/30/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 150 | Track Base Course Asphalt                  | 3 days   | Wed 3/31/21  | Fri 4/2/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 151 | Track Base Course Cure Time                | 30 days  | Sat 4/3/21   | Sun 5/2/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 152 | Discus pits and cages                      | 10 days  | Mon 4/5/21   | Fri 4/23/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 153 | Shotput                                    | 10 days  | Mon 4/26/21  | Mon 5/10/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 154 | Long Jump & Pits                           | 10 days  | Tue 5/11/21  | Thu 5/27/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 155 | Track Surface Course Asphalt               | 3 days   | Mon 5/3/21   | Thu 5/6/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 156 | Track Surface Course Cure Time             | 5 days   | Fri 5/7/21   | Tue 5/11/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 157 | Track Striping                             | 5 days   | Mon 4/5/21   | Mon 4/12/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 158 | Foundations                                | 113 days | Thu 11/19/20 | Tue 6/29/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 159 | Middle School                              | 113 days | Thu 11/19/20 | Tue 6/29/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 160 | Area ABC (North)                           | 32 days  | Thu 11/19/20 | Fri 1/29/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |

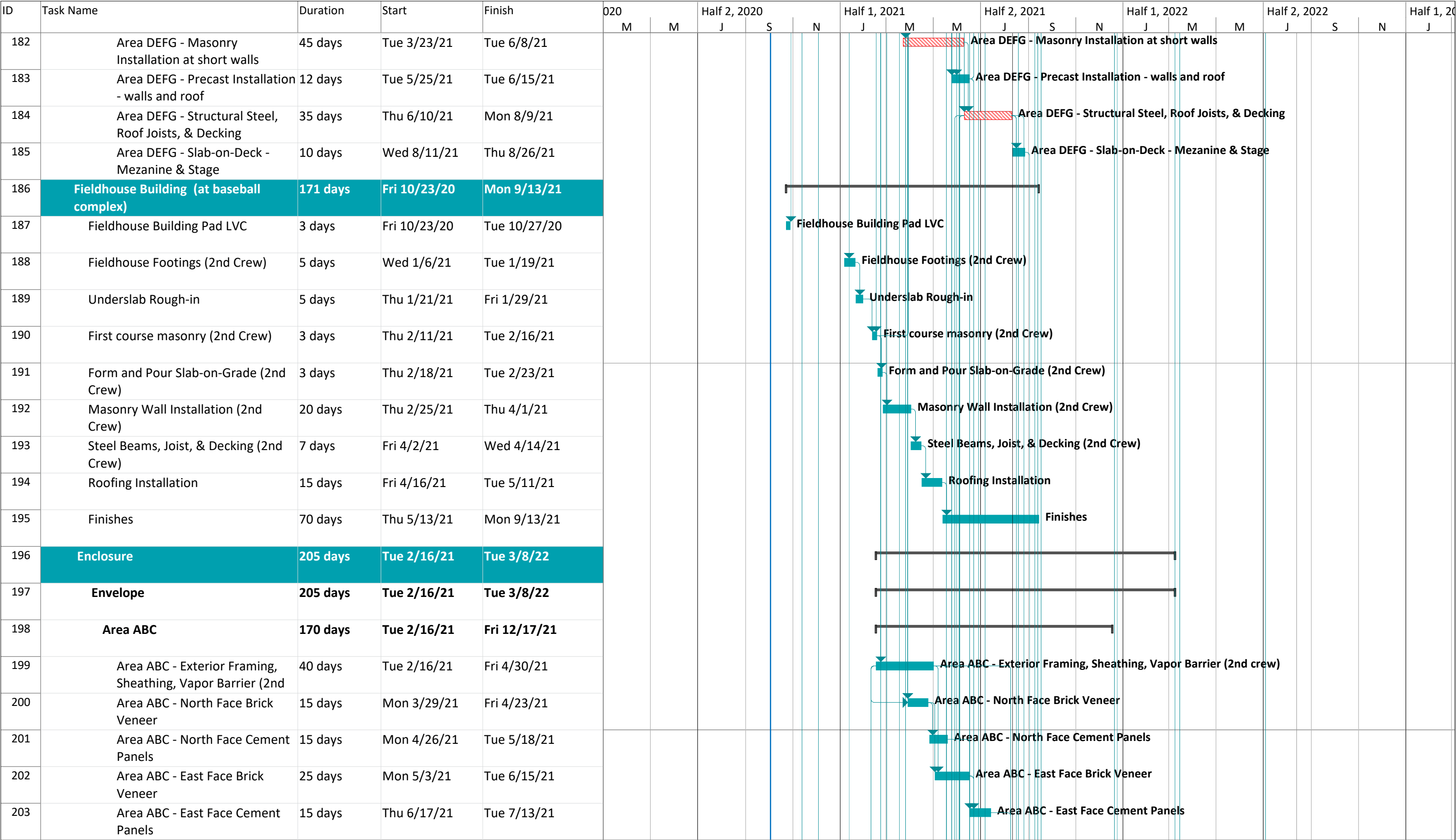
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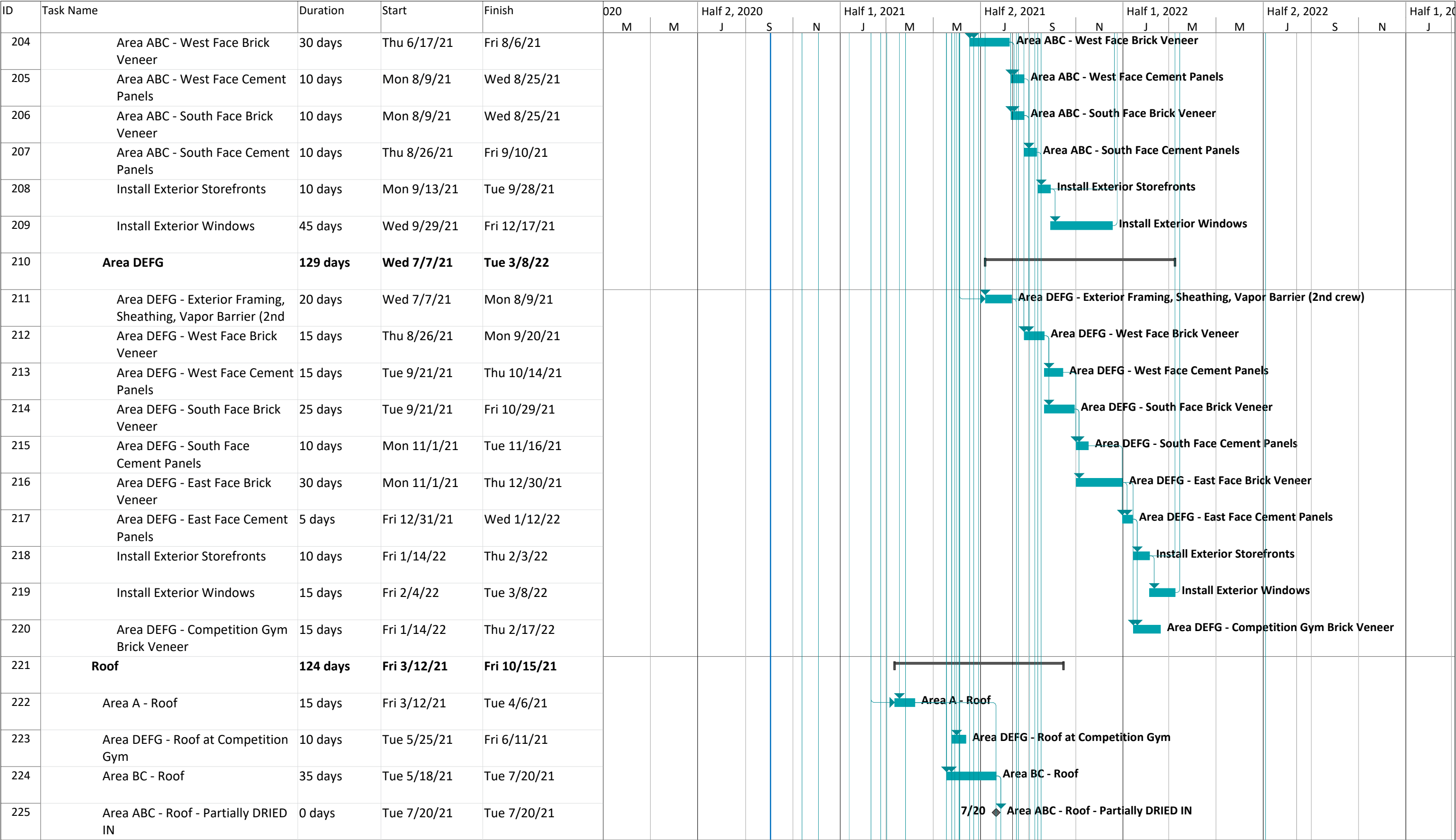


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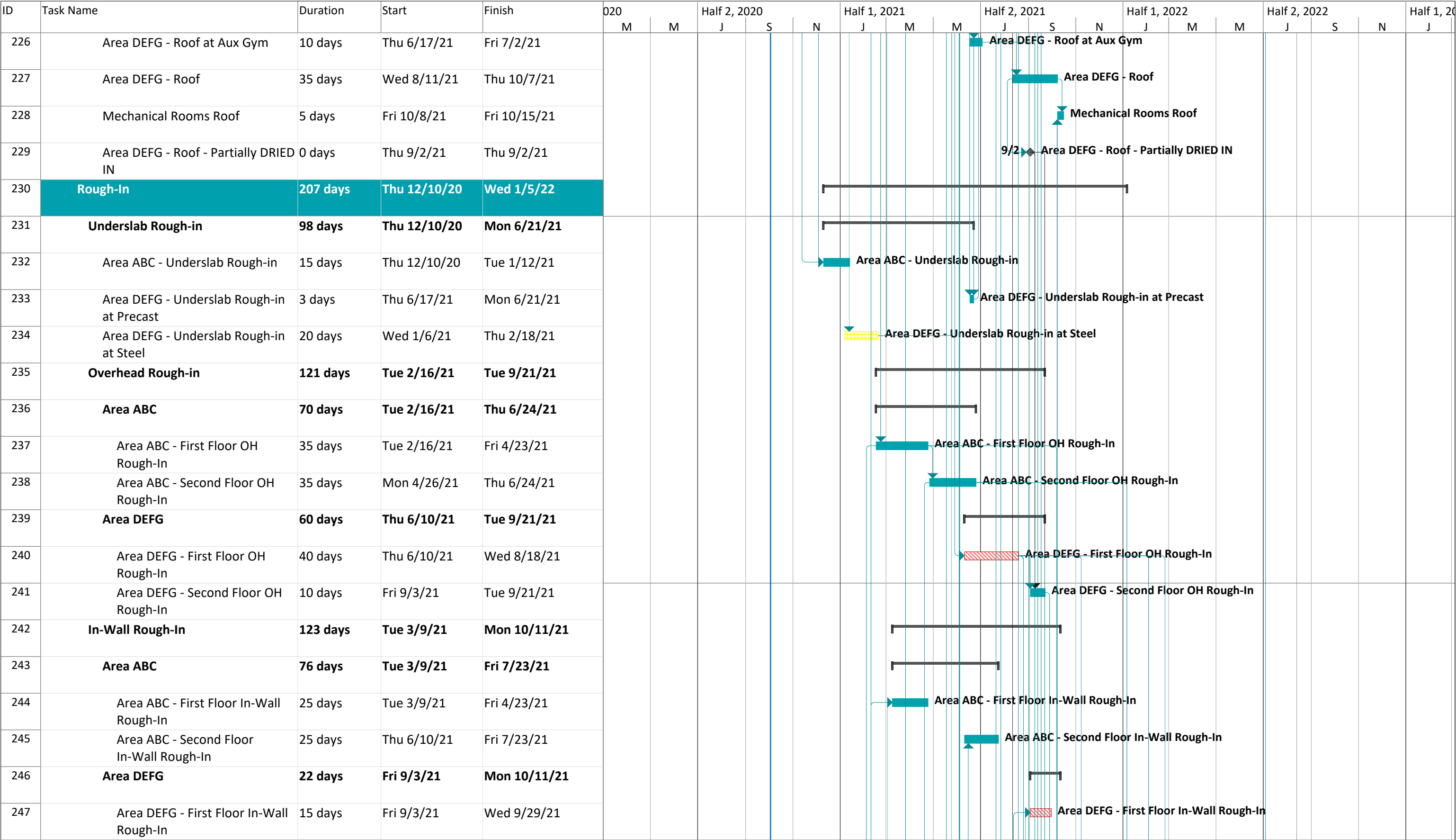




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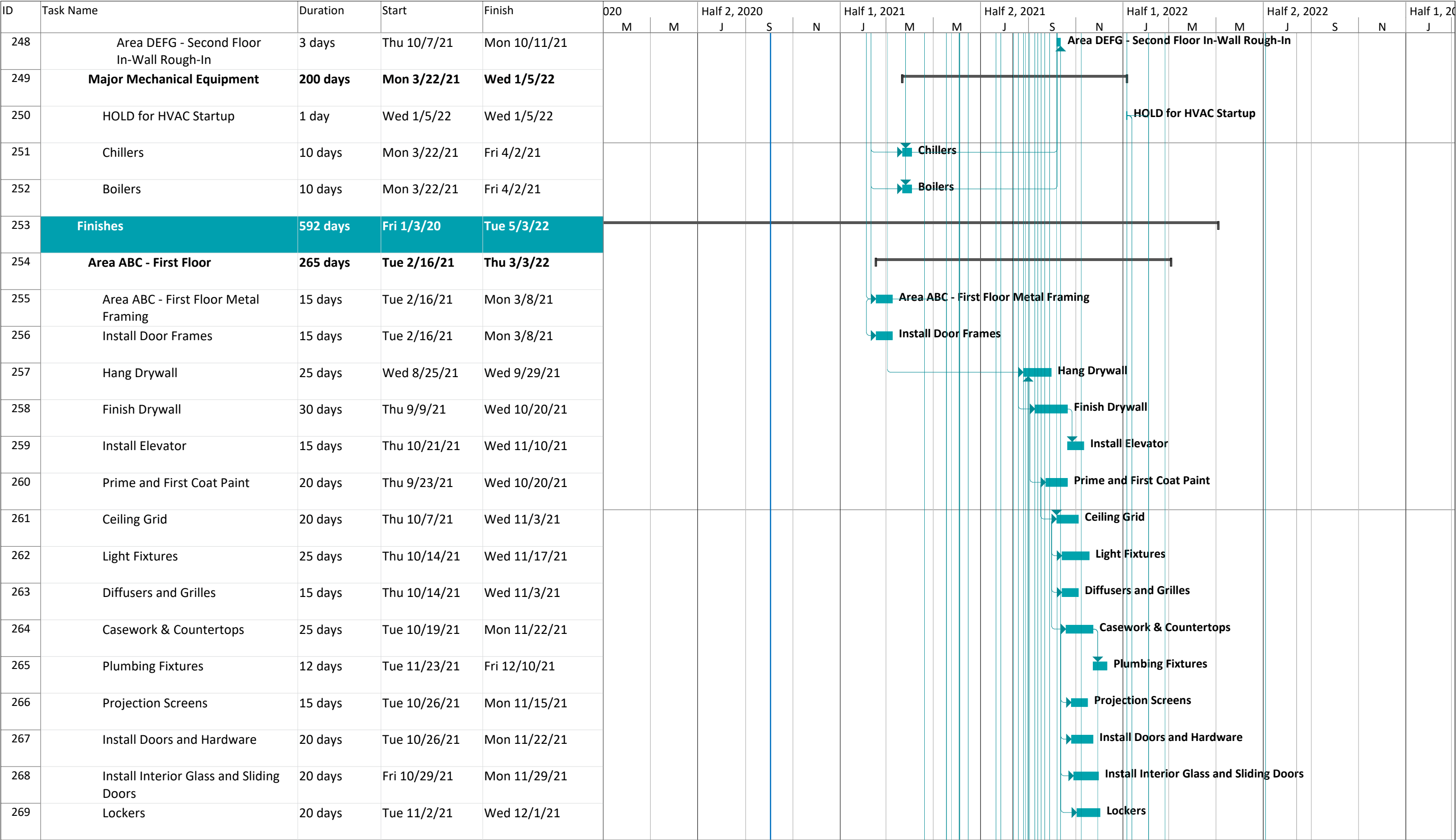
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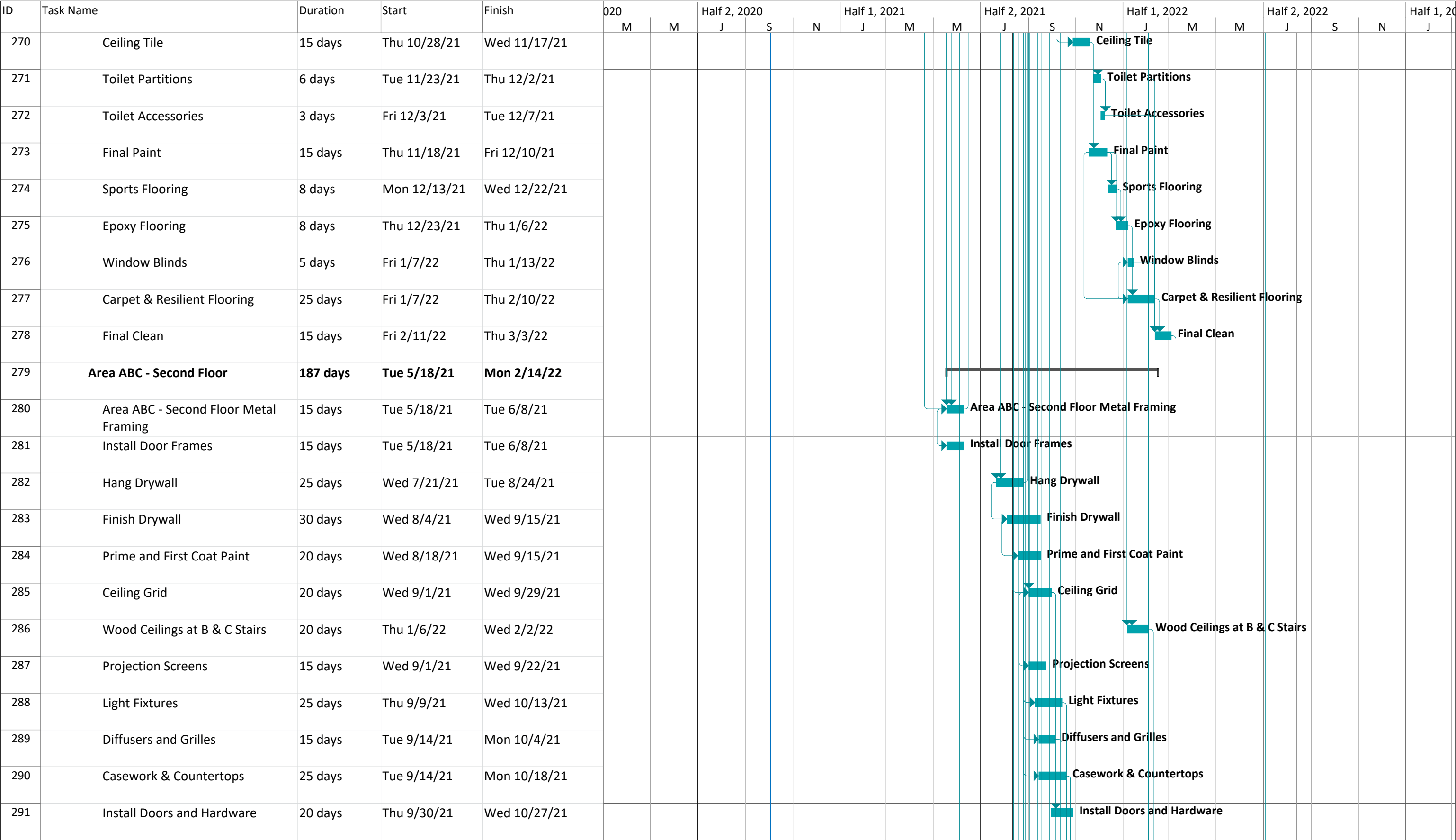


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| ID  | Task Name                                | Duration | Start        | Finish       | 020 |   | Half 2, 2020 |   |   | Half 1, 2021 |   |   | Half 2, 2021 |   |   | Half 1, 2022 |   |   | Half 2, 2022 |   |   | Half 1, 2023 |   |
|-----|--|----------|--------------|--------------|-----|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|
|     |  |          |              |              | M   | M | J            | S | N | J            | M | M | J            | S | N | J            | M | M | J            | S | N | J            | J |
| 292 | Install Interior Glass and Sliding Doors | 20 days  | Thu 9/30/21  | Wed 10/27/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 293 | Ceiling Tile                             | 15 days  | Thu 10/14/21 | Wed 11/3/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 294 | Kitchen Equipment                        | 4 days   | Tue 10/19/21 | Fri 10/22/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 295 | Plumbing Fixtures                        | 7 days   | Tue 10/19/21 | Wed 10/27/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 296 | Lockers                                  | 20 days  | Tue 10/19/21 | Mon 11/15/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 297 | Toilet Accessories                       | 3 days   | Tue 11/16/21 | Thu 11/18/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 298 | Window Blinds                            | 5 days   | Thu 10/28/21 | Wed 11/3/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 299 | Final Paint                              | 15 days  | Tue 11/16/21 | Wed 12/8/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 300 | Epoxy Flooring                           | 5 days   | Thu 12/9/21  | Wed 12/15/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 301 | Resilient & Carpet Flooring              | 25 days  | Thu 12/16/21 | Mon 1/24/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 302 | Final Clean                              | 15 days  | Tue 1/25/22  | Mon 2/14/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 303 | Area DEFG - First Floor                  | 178 days | Thu 8/19/21  | Tue 5/3/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 304 | Install Door Frames in Masonry           | 1 day    | Fri 8/27/21  | Fri 8/27/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 305 | Area DEFG - First Floor Metal Framing    | 20 days  | Thu 8/19/21  | Thu 9/16/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 306 | Hang Drywall                             | 15 days  | Mon 9/20/21  | Fri 10/8/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 307 | Finish Drywall                           | 20 days  | Mon 10/11/21 | Fri 11/5/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 308 | Paint Exposed Ceilings                   | 14 days  | Thu 8/19/21  | Wed 9/8/21   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 309 | Gym Equipment                            | 20 days  | Thu 8/19/21  | Thu 9/16/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 310 | Prime and First Coat Paint               | 30 days  | Mon 10/25/21 | Tue 12/7/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 311 | Aux Gym Baffles                          | 10 days  | Thu 9/9/21   | Wed 9/22/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 312 | Ceiling Grid                             | 20 days  | Mon 11/8/21  | Tue 12/7/21  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |
| 313 | Install Kitchen Freezer & Cooler         | 5 days   | Mon 11/8/21  | Fri 11/12/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |

Task

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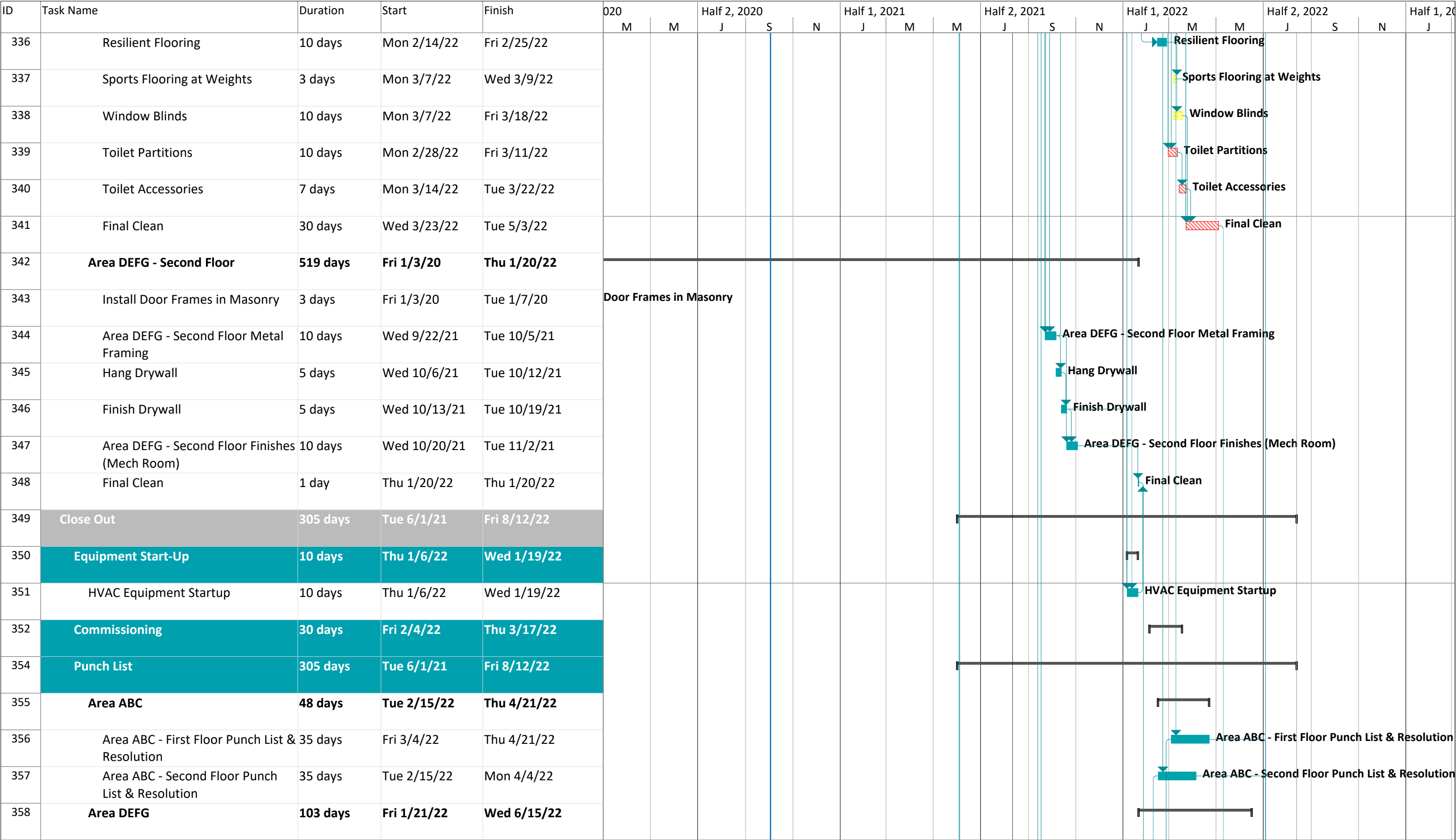
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| ID  | Task Name                     | Duration | Start        | Finish       | 020 |   | Half 2, 2020 |   |   | Half 1, 2021 |   |   | Half 2, 2021 |   |   | Half 1, 2022 |   |   | Half 2, 2022 |   |   | Half 1, 2023 |
|-----|-------------------------------|----------|--------------|--------------|-----|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|
|     |                               |          |              |              | M   | M | J            | S | N | J            | M | M | J            | S | N | J            | M | M | J            | S | N | J            |
| 314 | Light Fixtures                | 25 days  | Mon 11/15/21 | Tue 12/21/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 315 | Install Doors and Hardware    | 25 days  | Thu 1/6/22   | Wed 2/9/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 316 | Competition Gym Wood Flooring | 15 days  | Thu 1/6/22   | Wed 1/26/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 317 | Epoxy Flooring                | 20 days  | Thu 1/6/22   | Wed 2/2/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 318 | Install Kitchen Hoods         | 5 days   | Wed 12/8/21  | Tue 12/14/21 |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 319 | Diffusers and Grilles         | 20 days  | Wed 12/8/21  | Fri 1/7/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 320 | Install Interior Glazing      | 20 days  | Wed 12/8/21  | Fri 1/7/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 321 | Competition Gym Bleachers     | 10 days  | Thu 1/27/22  | Wed 2/9/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 322 | Aux Gym Wood Flooring         | 15 days  | Thu 1/27/22  | Wed 2/16/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 323 | Commons - Wood Ceilings       | 15 days  | Thu 2/3/22   | Wed 2/23/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 324 | Kitchen Equipment             | 15 days  | Thu 2/3/22   | Wed 2/23/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 325 | Kitchen Equipment MEP Hookups | 10 days  | Thu 2/24/22  | Wed 3/9/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 326 | Aux Gym Bleachers             | 5 days   | Thu 2/17/22  | Wed 2/23/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 327 | Ceiling Tile                  | 20 days  | Fri 12/31/21 | Fri 1/28/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 328 | Casework & Countertops        | 20 days  | Fri 12/31/21 | Fri 1/28/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 329 | Media Center - Wood Ceilings  | 8 days   | Thu 2/24/22  | Mon 3/7/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 330 | Final Paint                   | 25 days  | Mon 1/31/22  | Fri 3/4/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 331 | Operable Partitions           | 10 days  | Mon 1/31/22  | Fri 2/11/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 332 | Projection Screens            | 5 days   | Mon 1/31/22  | Fri 2/4/22   |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 333 | Lockers & Benches             | 20 days  | Mon 1/31/22  | Fri 2/25/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 334 | Carpet Flooring               | 5 days   | Mon 2/7/22   | Fri 2/11/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 335 | Plumbing Fixtures             | 20 days  | Mon 1/31/22  | Fri 2/25/22  |     |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |

Task

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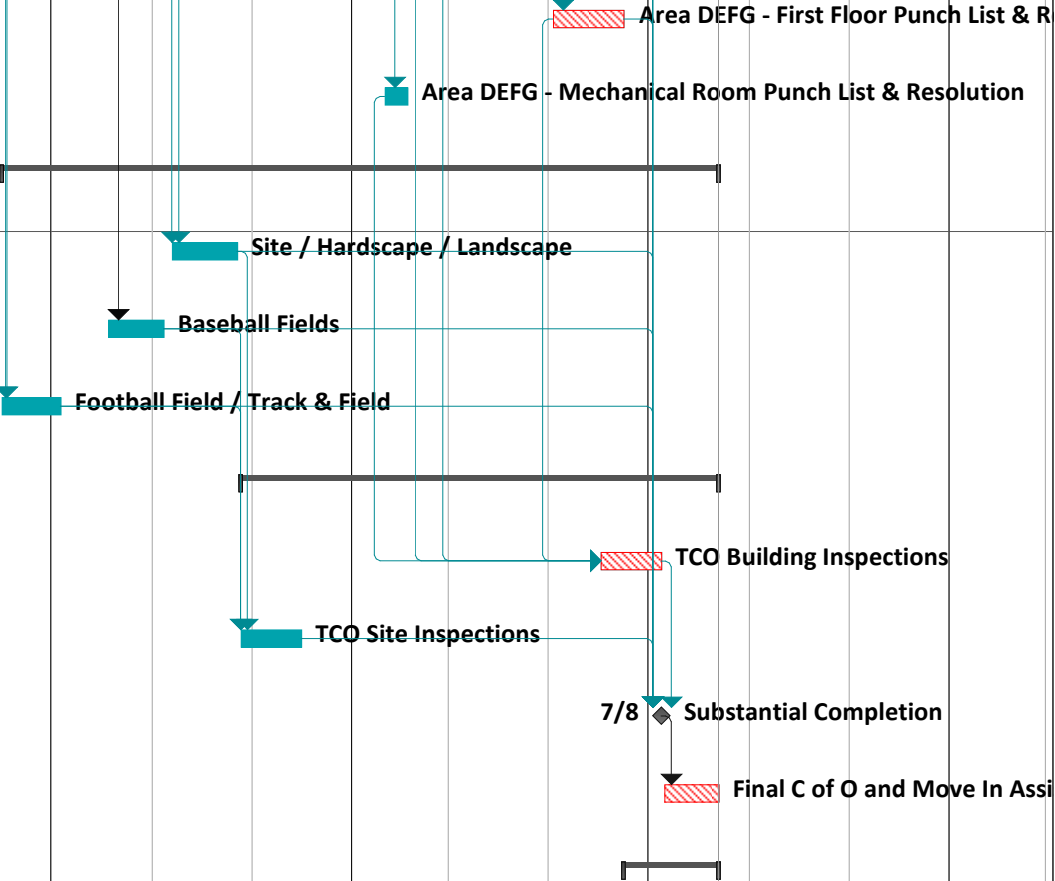


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| ID  | Task Name   | Duration | Start        | Finish       | 2020 |   | Half 2, 2020 |   |   | Half 1, 2021 |   |   | Half 2, 2021 |   |   | Half 1, 2022 |   |   | Half 2, 2022 |   |   | Half 1, 2023 |
|-----|---|----------|--------------|--------------|------|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|---|--------------|
|     |   |          |              |              | M    | M | J            | S | N | J            | M | M | J            | S | N | J            | M | M | J            | S | N |              |
| 359 | Area DEFG - First Floor Punch List & Resolution     | 30 days  | Wed 5/4/22   | Wed 6/15/22  |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 360 | Area DEFG - Mechanical Room Punch List & Resolution | 10 days  | Fri 1/21/22  | Thu 2/3/22   |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 361 | Site  | 237 days | Tue 6/1/21   | Fri 8/12/22  |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 362 | Site / Hardscape / Landscape                        | 25 days  | Mon 9/13/21  | Fri 10/22/21 |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 363 | Baseball Fields                                     | 20 days  | Thu 8/5/21   | Tue 9/7/21   |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 364 | Football Field / Track & Field                      | 20 days  | Tue 6/1/21   | Tue 7/6/21   |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 365 | Occupancy   | 203 days | Mon 10/25/21 | Fri 8/12/22  |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 366 | TCO Building Inspections                            | 26 days  | Thu 6/2/22   | Fri 7/8/22   |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 367 | TCO Site Inspections                                | 25 days  | Mon 10/25/21 | Tue 11/30/21 |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 368 | Substantial Completion                              | 0 days   | Fri 7/8/22   | Fri 7/8/22   |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 369 | Final C of O and Move In Assistance                 | 25 days  | Mon 7/11/22  | Fri 8/12/22  |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 370 | Owner Activities                                    | 41 days  | Thu 6/16/22  | Fri 8/12/22  |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |
| 375 | Weather Days  | 423 days | Tue 1/2/18   | Fri 1/3/20   |      |   |              |   |   |              |   |   |              |   |   |              |   |   |              |   |   |              |

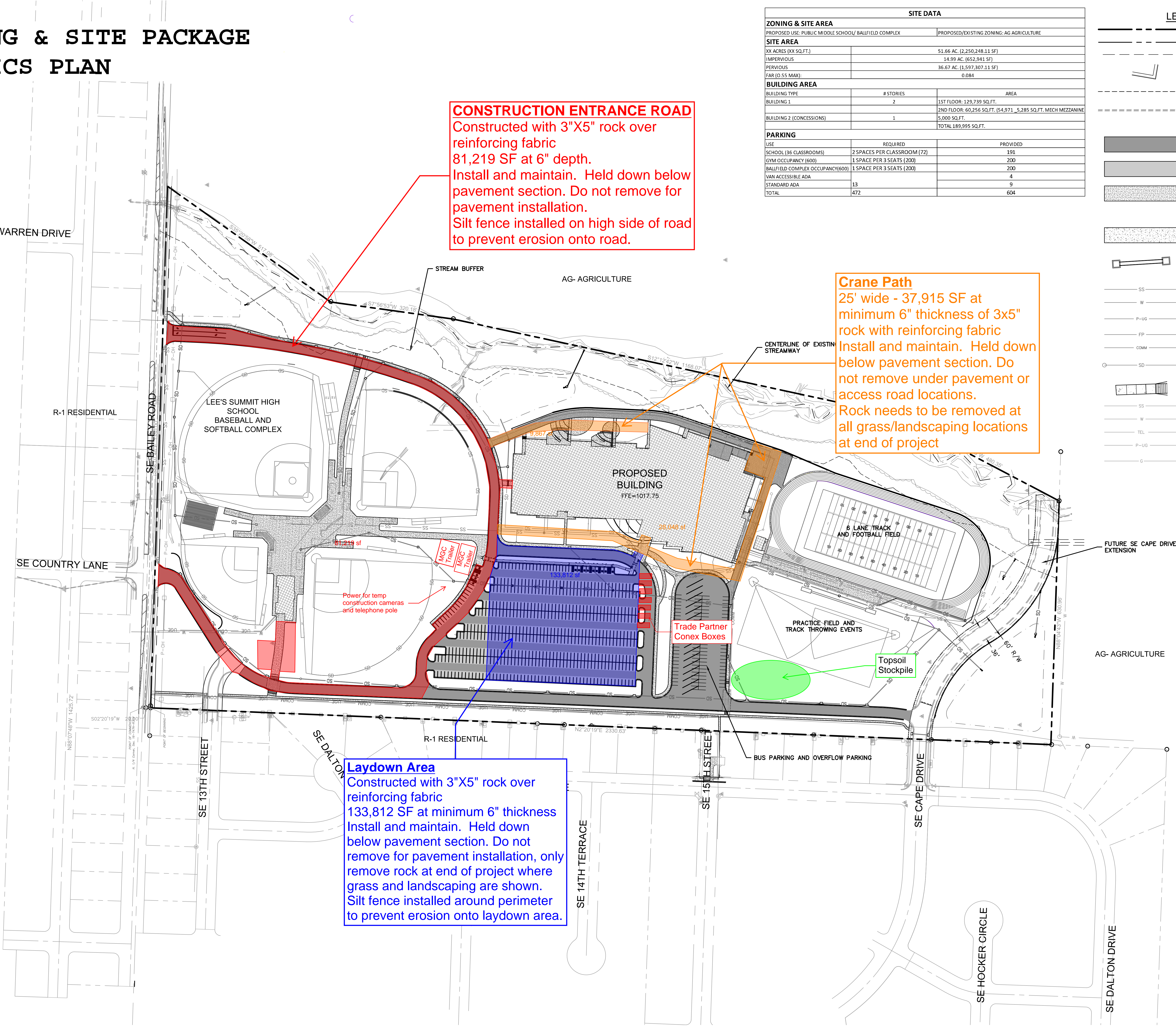


Task  
Critical  
Near Critical





BUILDING & SITE PACKAGE  
LOGISTICS PLAN



| SITE DATA   |                             |   |
|---|-----------------------------|---|
| ZONING & SITE AREA                                    |                             |   |
| PROPOSED USE: PUBLIC MIDDLE SCHOOL/ BALLFIELD COMPLEX |                             | PROPOSED/EXISTING ZONING: AG AGRICULTURE                      |
| SITE AREA   |                             |   |
| XX ACRES (XX SQ.FT.)                                  |                             | 51.66 AC. (2,250,248.11 SF)                                   |
| IMPERVIOUS  |                             | 14.99 AC. (652,941 SF)  |
| PERVIOUS  |                             | 36.67 AC. (1,597,307.11 SF)                                   |
| FAR (0.55 MAX):                                       |                             | 0.084   |
| BUILDING AREA   |                             |   |
| BUILDING TYPE   | # STORIES                   | AREA  |
| BUILDING 1  | 2                           | 1ST FLOOR: 129,739 SQ.FT.                                     |
|   |                             | 2ND FLOOR: 60,256 SQ.FT. (54,971 5,285 SQ.FT. MECH MEZZANINE) |
| BUILDING 2 (CONCESSIONS)                              | 1                           | 5,000 SQ.FT.  |
|   |                             | TOTAL 189,995 SQ.FT.  |
| PARKING   |                             |   |
| USE   | REQUIRED                    | PROVIDED  |
| SCHOOL (36 CLASSROOMS)                                | 2 SPACES PER CLASSROOM (72) | 191   |
| GYM OCCUPANCY (600)                                   | 1 SPACE PER 3 SEATS (200)   | 200   |
| BALLFIELD COMPLEX OCCUPANCY(600)                      | 1 SPACE PER 3 SEATS (200)   | 200   |
| VAN ACCESSIBLE ADA                                    |                             | 4   |
| STANDARD ADA  | 13                          | 9   |
| TOTAL   | 472                         | 604   |

| LEGEND |  |
|--------|--|
|        | PROPERTY LINE  |
|        | LOT LINE   |
|        | UTILITY EASEMENT   |
|        | CONSTRUCT CONCRETE CURB & GUTTER   |
|        | SAWCUT PAVEMENT FULL DEPTH   |
|        | ADA PATH   |
|        | HEAVY DUTY ASPHALT PAVEMENT: 6-1/2" ASPHALT ON A 6" CLEAN ROCK BASE OR AS SPECIFIED IN THE DISTRICT'S GEOTECHNICAL REPORT.   |
|        | LIGHT DUTY ASPHALT PAVEMENT: 5-1/2" ASPHALT ON A 6" CLEAN ROCK BASE OR AS SPECIFIED IN THE DISTRICT'S GEOTECHNICAL REPORT.   |
|        | HEAVY DUTY CONCRETE PAVEMENT: 5" ASPHALTIC CONCRETE BASE, 1-1/2" ASPHALTIC CONCRETE SURFACE ON A 6" GRANULAR BASE COURSE ON A 6" STABILIZED SUBGRADE, OR AS SPECIFIED IN THE DISTRICT'S GEOTECHNICAL REPORT. |
|        | CONCRETE PAVEMENT  |
|        | STORM SEWER  |
|        | SANITARY SERVICE LINE  |
|        | WATER SERVICE LINE   |
|        | UNDERGROUND POWER SERVICE LINE   |
|        | FIRE PROTECTION LINE   |
|        | COMMUNICATIONS SERVICE LINE  |
|        | LANDSCAPE/ROOF DRAIN   |
|        | ADA CONCRETE SIDEWALK AND RAMP   |
|        | EXISTING SANITARY SEWER MAIN   |
|        | EXISTING WATER MAIN  |
|        | EXISTING COMMUNICATIONS LINE   |
|        | EXISTING ELECTRIC LINE   |
|        | EXISTING GAS MAIN  |

DWG: F:\2020\0001-0500\020-0103\40-Design\AutoCAD\Final Plans\Sheets\GNV\CONSTRUCTION DOCUMENTS\C\_GEN01\_0200103.dwg  
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USER: bkimmich







# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

Subcontractor is expected to fulfill all the obligations contained in the Master Subcontract Agreement (“MSA”), and, in addition, the following requirements. In the event of any inconsistency between the MSA and the contents of this Scope of Work, Subcontractor shall comply with the more stringent requirement. Sample MSA is attached, reference section 002000 – Bidding Requirements.

Subcontractor is responsible for all items outlined and included in this section. For scope-specific clarifications, please see corresponding bid package scopes of work.

### 00 21 01 – Special Working Conditions

Reference Owner Contract for additional information. This includes, but is not limited to:

- 1.1.1 Liquidated damages in the amount of \$2,000 per day for delay caused by Subcontractor that impacts critical path and therefore substantial completion.
- 1.1.2 Owner has a policy prohibiting smoking, vaping, or other use of tobacco or vaping products in all of Owner's owned or leased buildings, on all grounds, and at all athletic facilities. Construction Manager agrees to comply with such policy and to require its contractors, subcontractors and sub-subcontractors to comply. Construction Manager agrees to prohibit its employees, agents, and servants, and the employees, agents, and servants of Construction Manager's contractors, sub-contractors and sub-sub-contractors from smoking, vaping, or other use of tobacco or other vaping products in all of Owner's owned or leased buildings, on all grounds, and at all athletic facilities.
- 1.1.3 Project is receiving funding from State of Missouri. Trade Partners to adhere to associated State of Missouri requirements including, but not limited to:
  - 1.1.3.1 All rates must be in accordance w/ Annual Wage Order No. 27
  - 1.1.3.2 Certified Payroll to be submitted to McCownGordon on no less than a monthly basis.
  - 1.1.3.3 Proof of OSHA 10 Hr Certification must be provided for all team members providing labor on the project.
- 1.1.4 Provide third party, certified background check for all employee’s that will be on site. Confirming that no felonies, listed on Sexual Offender, etc. for review by District and McCownGordon a minimum of two weeks prior to employee being on site.
  - 1.1.4.1 In addition to approved background check, McCownGordon will provide project specific training and issue badge or sticker to be worn by employee at all times. This will allow everyone on site to recognize individuals on site are approved
- 1.1.5 Weather Days
  - 1.1.5.1 Weather days listed below have been incorporated into the bid schedule. “Duration” is the amount of time the bidder must complete the work by. The “Start” and “Finish” dates on the schedule include the weather days.
  - 1.1.5.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15. In case of claim of extensions of time because of adverse weather, such extensions of time shall be granted only when such adverse weather prevented the execution of major items of Work on normal working days, and such Work is identified on the critical path of construction in the construction schedule most recently submitted prior to the occurrence of the event causing the delay. Additional days will only be granted when the total number of adverse weather days used exceeds the total number of monthly anticipated weather days listed below. Anticipated monthly weather days are to be included in the Contract Schedule.

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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

Unused anticipated weather days shall accrue throughout the Project for each critical path activity. By way of example, once dry-in is completed, unused weather days will not carry forward to offset interior activities nor shall unused weather days affect material procurement. The anticipated monthly adverse weather days shall be:

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

### **00 21 02 – Safety | Housekeeping**

#### **1.2 General Safety**

- 1.2.1.1 The subcontractor agrees to furnish to the contractors, the name, home address, and home telephone number of his current on-site supervisor and safety representative. The event of a change in supervisory personnel, the subcontractor shall immediately notify the contractor and provide current information of the new supervisor.
- 1.2.1.2 Every Subcontractor will identify, by name, at the time of contract award, the most senior onsite manager with accountability for injury free construction. A full time, onsite, qualified, safety professional is required at the specific request of McCownGordon Construction. Additional safety professionals may be required with project manpower increases at the discretion of McCownGordon Construction. McCownGordon Construction reserves the right of determination of qualifications of the assigned safety professional on an individual basis. If deemed unsuitable by experience of qualification, the safety representative will be replaced at the subcontractor’s expense.
- 1.2.1.3 Subcontractor’s safety representative shall actively participate in all meetings and job walks as specified by McCownGordon Construction. On site availability of the safety professional is at the discretion of McCownGordon Construction.
- 1.2.1.4 Below is the requirement for Subcontractor’s Safety Representative to visit the site based on this Subcontractor’s manpower onsite.
  - 1.2.1.4.1 1-10 workers Safety Rep 1 day a week
  - 1.2.1.4.2 11-20 workers Safety Rep 2 days a week
  - 1.2.1.4.3 21-40 workers Safety Rep 3 days a week
  - 1.2.1.4.4 40+ workers Safety Rep is fulltime
- 1.2.1.5 Provide all provisions necessary to meet OSHA requirements for work performed under this scope. This includes proper PPE utilized correctly. Hardhats, safety glasses, and high visibility vests/shirts will be worn at all times. This includes all workers and delivery personnel
- 1.2.1.6 Protection of slab-on-grade is required. All lifts are to have diaphragms and non-marking tires.
- 1.2.1.7 All temporary power sources must be GFCI protected, it is the responsibility of each Subcontractor to confirm or provide GFCI protection per OSHA standards.
- 1.2.1.8 Included are all costs associated with OSHA compliance when dealing with

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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

environmental issues during work activities. All signage, tie off points, etc. required to comply with all local, state, federal and owner/contractor requirements for this scope of work.

- 1.2.1.9 Verification of all existing utilities as required to complete the work for this project to be included under this bid package. Including coordination with McCownGordon Construction, owner of the project and/or property, and the utility companies as applicable. Private locates are required for all utilities not covered under the 811 call system. All private locates are at the expense of subcontractor performing the work to include subcontractor subcontractors. Any cutting, drilling, coring, etc. of existing slabs, subcontractors will be required hire and pay for ground penetrating/scanning before this work is started.

### 1.2.2 MGC Safety Forms/Procedures

- 1.2.2.1 All subcontractor personnel are required to attend a site-specific safety orientation prior to working on site.
- 1.2.2.2 Forms will be required from all contractors. These forms include but are not limited to the following:
  - 1.2.2.2.1 Method of Procedures (MOP)
    - 1.2.2.2.1.1 Subcontractor to fill out form for all high hazard operations prior to pre-install meetings.
  - 1.2.2.2.2 Competent Person Form
    - 1.2.2.2.2.1 Subcontractor completes form and deliveries to McCownGordon Construction prior to work starting on site. This is the Subcontractor’s person who has the knowledge and authority to implement all necessary safety procedures for their scope of work.
  - 1.2.2.2.3 Weekly Safety Inspection Forms
    - 1.2.2.2.3.1 Subcontractor must conduct a formal weekly jobsite inspection and turn the results into McCownGordon Construction.
  - 1.2.2.2.4 Site Specific Fall Protection Plan
    - 1.2.2.2.4.1 Subcontractor is required to submit plan for all work over 6’ in height. This is to be submitted to the onsite superintendent prior to work starting on site.

### 1.2.3 Air Containments and Monitoring

- 1.2.3.1 When powered equipment, other than electrical, is utilized inside an enclosed area, continuous air monitoring must occur, and documentation of air results must be maintained and submitted to the daily. This includes the operation of such equipment as diesel powered welding machines, gas generators, diesel powered forklifts, quickie saws, etc. Each subcontractor, and any tier, is responsible for providing such air monitoring equipment and training to its employees.
- 1.2.3.2 Special OSHA Silica Enforcement Provisions:
  - 1.2.3.2.1 There shall be NO “dry” cutting, grinding, large bore drilling of concrete, CMU or other silica containing material. All dust containing silica must be collected in accordance with applicable NIOSH, ANSI, OSHA and governing Authorities having jurisdiction.

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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

- 1.2.3.2.2 Subcontractor and their tiered subcontractors will be responsible for ensuring any operations generating dust shall use necessary means to control the dust and minimize or remove exposures. This includes, but is not limited to haul roads, grinding, drilling, chipping, hammering, sawing, polishing and cutting operations, etc.
  - 1.2.3.2.3 McCownGordon Construction reserves the right to require subcontractor to perform additional air monitoring.
  - 1.2.3.2.4 When applicable, sweeping compound shall be used to control nuisance dust from daily sweeping of working surfaces.
  - 1.2.3.2.5 Subcontractor and their tiered subcontractors will be responsible for ensuring appropriate PPE for any exposures or supply McCownGordon Construction with Negative Exposure Assessments confirming exposure limits are below those established by OSHA, NIOSH, EPA or other governing authorities for the specific exposure. This includes, but is not limited to, nuisance dust and silica from operations, drilling and cutting operations, metal fume and hexavalent chromium from hot work operations, etc.
- 1.2.4 Cleanup
  - 1.2.4.1 Subcontractor shall clean up and place trash in dumpsters furnished by others on a daily basis or as directed by McCownGordon Construction’s Superintendent. Subcontractor will also be responsible for participating in a composite clean-up crew. Clean-up by composite crew is to take place one (1) day per week, or as directed by the McCownGordon Construction’s Superintendent
- 1.2.5 Temporary Light and Power
  - 1.2.5.1 The Contractor, through the electrical subcontractor, shall provide building temporary 120-Volt power to panels for use by Subcontractors. All power requirements other than 120V will be the Subcontractor’s responsibility. When the permanent power system is ready, it shall be made available for temporary use as required. Subcontractors need to provide GFCI protection for their own work.
  - 1.2.5.2 Each Subcontractor shall provide their own extension cords and fittings as required.
  - 1.2.5.3 The General Contractor, through the electrical subcontractor, will provide general lighting and lighting for stairwells per OSHA. Each Subcontractor will be responsible for any specific task lighting requirements over and above the general lighting provided by the Contractor.
- 1.2.6 Drinking Water
  - 1.2.6.1 Subcontractor will be responsible for their own drinking water and ice.
- 1.2.7 Temporary Toilets
  - 1.2.7.1 McCownGordon Construction shall provide proper sanitary arrangements for workmen. Such facilities shall be kept clean and maintained in accordance with the requirements of regulatory authorities having jurisdiction.
  - 1.2.7.2 Under no circumstance should the existing restrooms in the occupied facility be used by construction workforce. Failure to adhere to this requirement may result in removal from the project site.
- 1.2.8 Flagmen and Traffic Regulations
  - 1.2.8.1 Subcontractor will be required to provide their own flagmen for Work requiring

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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

flagmen such as deliveries, hauling material from site, etc., or as directed by the Project Superintendent.

1.2.8.2 Where streets now in use are within or adjacent to the Work, keep the passageways of such streets open to vehicular and pedestrian traffic from building frontage thereon. Maintain continual access for police, fire, and ambulance service. Keep all roadways clean from debris as required by county, city, and state, and McCownGordon Construction requirements.

1.2.8.3 Any road closure permits necessary for contractor’s scope of work are the sole responsibility of the Subcontractor.

### 1.2.9 Barriers and Snow/Ice Removal

1.2.9.1 Subcontractor shall properly protect and safeguard Subcontractor's work. The Owner or McCownGordon Construction shall not, in any way, be liable or responsible for the damage or loss to the Work due to trespass or theft.

1.2.9.2 Subcontractor shall provide removal of snow, ice and/or water as required to perform their own scope of work.

### 1.2.10 Protection of Work

1.2.10.1 Subcontractor shall be required to protect existing work from damage due to this Subcontractor’s operations. If this Subcontractor damages the work of others, it is this Subcontractor’s responsibility to repair and/or replace the damaged work. Subcontractor shall use specified materials as is required to comply with the Contract Documents and provide all guarantees and warranties as were in place or to be in place upon acceptance by the Owner. Subcontractor shall endeavor to have the original installer make the required repairs at this Subcontractor’s costs.

1.2.10.2 In the event of a dispute over who damaged or caused damage to a portion of the work, McCownGordon Construction shall make such determination and require the Subcontractor to make the required repairs. If the Subcontractor fails to provide the repairs, McCownGordon Construction will take such action to make the repair at the cost to the Subcontractor causing the damage as determined at McCownGordon Construction’s sole discretion.

1.2.10.3 Dewatering and/or protection of work areas is the responsibility of each contractor

1.2.10.4 Security of materials, tools, equipment, etc., is the responsibility of each Subcontractor for their own materials, tools, equipment, etc. Each Subcontractor shall be responsible for properly barricading, protecting, and safeguarding his work. The Owner or Contractor shall not in any way be liable or responsible for the damage or loss to the work due to trespass, theft, and/or vandalism.

1.2.10.5 Subcontractors shall take measures to preserve, protect, and keep clean floors. Subcontractor is responsible for cleaning floors back to the condition they were before starting their work. Drop cloths shall be used to prevent construction materials from soiling such floors. The rubber tires of lifts and equipment shall be covered so as to not leave tire marks on floors. Lifts must have under carriage covers to prevent leaks from lifts/equipment from damaging floors.

1.2.10.6 This Subcontractor is aware of the roofing material on this project and that it can be easily damaged. Subcontractor to take all necessary precautions as required to protect this roof and further agrees to be responsible for all damage that may result from this Subcontractor’s activities.

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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

### 1.2.11 Access | Loading

1.2.11.1 Subcontractor is required to observe all loading limits of the facility and site and shall not overload any portions of the facility or site. Subcontractor shall be required to provide all access ramps, shoring and dunnage as may be required to properly access the work area and all other safety devices as may be necessary. The utilization of power lifts (i.e. scissor lifts, boom lifts) shall be reviewed on a case-by-case basis. Subcontractor shall be required to implement additional safety provisions as required for the utilization of motorized lifts. Extra care shall be given at edges where tipping of lifts is possible.

### 1.2.12 Storm Water Management Plan (SWMP)

1.2.12.1 McCownGordon Construction has developed and implemented a Storm Water Management Plan (SWMP) to address the local, state and Federal stormwater permitting requirements. The permit requires and the SWMP identifies controls MGC must implement and maintain throughout the length of the project to minimize or prevent pollutants from collecting in stormwater and be carried off site. Controls include but are not limited to the following: inlet protection, vehicle tracking controls, perimeter containment controls (such as silt fence and straw wattles), concrete washout areas and secondary containment for petroleum products and hazardous materials.

1.2.12.2 It is each Subcontractor’s responsibility to avoid disturbance, damage or removal of the SWMP controls. If the Subcontractor’s scope of work requires disturbance or removal of the SWMP controls, it is that Subcontractor’s responsibility to discuss with McCownGordon staff the need for the disturbance or removal and obtain approval prior to the disturbance or removal.

1.2.12.3 It will be this Subcontractor’s responsibility to provide sufficient labor, materials, equipment, and other items necessary to remove and replace back controls to their optimum condition. Any disturbance or removal that is required must be restored to optimal working condition, in accordance with the SWMP, by the Subcontractor. The SWMP contains design details on how controls must be installed. McCownGordon staff can provide those design details as needed.

1.2.12.4 Any blatant, malicious, or accidental acts by any Subcontractors employees that damage or destroy controls will be replaced and restored to optimum condition and costs incurred will be passed on to the offending Subcontractor.

1.2.12.5 Specific requirements regarding stormwater controls include, but are not limited to, the following:

1.2.12.5.1 All concrete waste must be disposed of in the designated concrete washout area. Disposal outside the washout area is not acceptable. Any spoils left from removal, accidental spills, or similar situations must be cleaned up and either disposed of offsite or placed in the designated concrete washout area.

1.2.12.5.2 If subcontractors store any petroleum, hazardous materials, paint, and other pollutant materials on site they must be clearly marked and stored in a safe location (covered and contained) so they cannot be accidentally spilled or intermixed with stormwater runoff. Any excess materials not used on site must be removed from the project by the Subcontractor. The Subcontractor will be back charged for any materials left on site that must

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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

be disposed of by MGC.

1.2.12.5.3 All items, materials, or stockpiles that are a potential pollutant source are required to be barricaded, contained, or stabilized in an acceptable manner to prevent them from becoming a pollutant, or environmental issue as defined by the EPA, state, and local requirements.

1.2.12.5.4 This section does not identify all possible scenarios or conditions regarding stormwater permit compliance. Any issues or questions by Subcontractors should be discussed with MGC project staff as they arise. It shall be Subcontractor’s responsibility to coordinate and comply with the requirements and conditions of the SWMP and Permit. Any fees assessed MGC for an act by a Subcontractor for non-compliance with the SWMP will be passed on to the offending Subcontractor.

### 1.3 Project specific Safety

#### 1.3.1.1 N/A

### 1.4 Site Specific Safety Plan

1.4.1.1 McCownGordon will create a project-specific Safety plan. All subcontractors are expected to follow the guidelines of this plan.

## **00 21 03 – Document Management**

### 1.5 Project Management Software

1.5.1.1 McCownGordon utilizes Procore for all electronic project document management. Each Subcontractor is required to use this software and submit documents electronically through Procore as needed.

1.5.1.2 This software is free to Subcontractor, but Subcontractor will be required to use this management system daily. McCownGordon Construction will provide necessary training and supplementary instructions as required.

### 1.6 Drawings and Specifications

1.6.1.1 All project drawings and specifications are maintained electronically on Procore.

1.6.1.2 If desired, hard copies of project documents are the responsibility of the Subcontractor to procure. McCownGordon will not provide paper copies of any project documentation.

### 1.7 Submittals and Shop Drawings

1.7.1.1 Electronic submittals are required and shall be submitted to McCownGordon project team through Procore

1.7.1.2 Samples shall be submitted in quantities as dictated by the individual specifications.

1.7.1.3 All submittals, shop drawings and samples shall be submitted as required to maintain the project schedule, but no later than 3 weeks from receipt of notice to proceed.

1.7.1.4 Provide all mock-ups and samples as indicated by the contract documents. Include mock-up fabrication on the jobsite and removal following completion of work.

### 1.8 Procurement

1.8.1.1 Complete scope of work/bid form table for applicable scopes.

1.8.1.2 All necessary “quick-shipping”, material expediting, procurement expediting and costs necessary to meet the scheduled completion date per the construction schedule is to be included.



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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

### 1.9 Pay Applications

- 1.9.1.1 All monthly progress and final billings are required to be submitted through Procore’s “Invoicing” function by the 20<sup>th</sup> of every month while forecasting to the end of the month. McCownGordon will receive approval by the 10<sup>th</sup> of the following month. Payment will be made by the 20<sup>th</sup> of the month following the approved invoice. Instructions for this function will be provided upon award of a scope of work

### 1.10 Change Orders – Reference Owner Contract for additional information.

- 1.10.1.1 For Work performed by a subcontractor and sub-subcontractor, the fee to the Construction Manager shall not exceed the percentage of the Construction Manager's Fee established under the Agreement on the Actual Cost of the Work, and any fee or premium paid to the subcontractor or sub-subcontractor (to be included as part of the Cost of the Work (as described in Article 6 of the Agreement) shall not exceed ten percent (10%) of the Actual Cost of the Work performed by such subcontractor or sub- subcontractor, and such fee or premium shall include and be on account of all other direct and indirect costs, including but not limited to Project overhead, profit, bonds, insurance, superintendent compensation, Project manager compensation, vehicles, utilities, printing/reproduction, office equipment, mobile offices, phones, computers, as-built modifications, site cleaning and safety, and all efforts made in coordinating pricing, material procurement, and installation.
- 1.10.1.2 As used herein, the term "Actual Cost of the Work" shall mean and include the direct cost of labor, materials and equipment necessary to install the changes in the Work. Such labor costs shall be computed using the hourly rates (including company paid employee benefits) of personnel involved in physically installing the changes in the Work. Material costs are the actual invoiced costs of materials as delivered to the site without mark-up for overhead, profit, or any other addition. Equipment costs shall be computed using the industry standard hourly rate for the equipment necessary to physically install the changes in the Work without mark-up for overhead, profit, or any other addition. All other direct and in-direct costs are not part of the Actual Cost of The Work. Expenses that are not part of the Actual Cost of the Work include, but shall not be limited to, Project overhead, profit, bonds, insurance, superintendent compensation, Project manager compensation, vehicles, utilities, printing/reproduction, office equipment, mobile offices, phones, computers, as-built modifications, site cleaning and safety, and all efforts made in coordinating pricing, material procurement, and installation.
- 1.10.1.3 Any pricing requested for changes in the work shall be submitted within one week.
- 1.10.1.4 All pricing shall be broken down with the following detail;
- 1.10.1.5 Labor, material, equipment, overhead and profit
  - 1.10.1.5.1 Labor must be broken down by labor rate and hours
- 1.10.1.6 Lump sum pricing will not be accepted.
- 1.10.1.7 Change order proposals shall include costs for all required insurance, bonds, permits, fees, etc.
- 1.10.1.8 Any pricing of field work tickets that are generated in the field by McCownGordon should be submitted within one week.

### 1.11 Closeout



# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

- 1.11.1.1 All manufacturer warranties, owner and maintenance manuals, operating instructions, etc. are to be submitted to McCownGordon within 30 days of being requested.
- 1.11.1.2 As-built drawings shall be maintained and updated throughout the project and submitted to McCownGordon for review and verification on a monthly basis.
- 1.11.1.3 Final as-built drawings shall be submitted no later than two weeks after substantial completion.

### **00 21 04 – Layout**

- 1.12 Unless explicitly stated in the specific work package, building corner and control points shall be provided by McCownGordon appointed licensed surveyor. All other layout required to complete each Subcontractor’s work shall be the responsibility of the Subcontractor
- 1.13 Subcontractor to provide all private and public locates as required to complete their scope of work. And damages incurred to public or private utilities will be the responsibility of the Subcontractor.
- 1.14 If applicable, examination of existing field conditions is the responsibility of the bidder PRIOR to submitting a bid. No additional costs will be paid for failure to sufficiently examine existing conditions.

### **00 21 05 – Meeting Schedule**

- 1.15 Approximately 2 weeks prior to starting trade-specific work, McCownGordon will schedule a meeting to review scope details and coordination. Attendance by the project manager and field foreman is mandatory for these meetings. Additional attendees may be required as necessary.
- 1.16 Weekly onsite progress meetings should be anticipated. Each Subcontractor will have representation present at each weekly meeting. This representation will possess knowledge on the scope of work, procurement, manpower, etc. and have the authority to make decisions for this contractor concerning schedule and pricing.

### **00 21 06 – Quality Control**

- 1.17 McCownGordon has a quality control/quality assurance program that all Subcontractors shall be required to participate.
- 1.18 Site Specific Quality Assurance Quality Control Plan
- 1.18.1 McCownGordon will create a Site Specific Quality Assurance Quality Control plan. All subcontractors are expected to follow the guidelines of this plan.

### **00 21 07 – Coordination**

- 1.19 McCownGordon has a quality control/quality assurance program that all Subcontractors shall be required to participate.
- 1.20 Overall building permit provided by others. Subcontractor shall be responsible for all permits required to complete their respective scope of work.
- 1.21 Subcontractor shall be responsible for coordination with the McCownGordon Construction, other Contractors, Subcontractors and the Owner. Change orders will not be issued for failure to coordinate.
- 1.22 Coordinate all deliveries and storage of materials onsite with McCownGordon Superintendent.
- 1.23 Subcontractor shall be responsible for any and all scaffolding or hoisting requirements to complete their scopes of work.
- 1.24 If Subcontractors scope of work requires sleeves, coring, saw cutting etc. to facilitate their scope of work, it is the responsibility of that Subcontractor to provide these measures. This includes x-ray

# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

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## BID PACKAGE 00 21 00 – GENERAL PROVISIONS

investigation of slabs/walls prior to coring. Any resultant damages or cleanup from coring/saw cutting will be the responsibility of the Subcontractor to remediate.

- 1.25 Each Subcontractor must provide the necessary manpower to monitor, protect and adjust their work items placed in concrete, masonry, grouting, etc. to ensure alignment of finished product.
- 1.26 Any scope of work performing any excavations, trenching or earthwork must be familiar with the Geotechnical Report and bid their work accordingly. Any spoils generated must be removed from the site within one week or stockpiled onsite as approved by the Superintendent.
- 1.27 Each Subcontractor must coordinate with the roofing contractor in order to schedule installation of roofing penetrations prior to roofing system installation.

### **00 21 08 – Virtual Construction | BIM**

- 1.28 This project will utilize 3D modeling and coordination. All trades shall review the BIM Supplemental Instructions and participate fully as indicated for their respective scope of work.

### **00 21 09 – Schedule Coordination and Phasing**

- 1.29 Subcontractor’s work shall be completed in accordance with durations shown in the project schedule, providing appropriate levels of manpower to meet or exceed the project schedule durations. The project schedule will be reviewed at each weekly progress meeting. All modification to the schedule at the progress meeting will be sent out with the meeting minutes and will become a Contract Document, superseding the original bid/contract schedule.
- 1.30 Include multiple mobilizations as required in accordance with schedule requirements.
- 1.31 Upon award (or prior to) of Subcontractor work Order, each Sub/Vendor shall submit to MGC a detailed man-loaded schedule showing compliance with the project schedule dates. The schedule will be updated monthly at a minimum. Subs/Vendors will be requested to participate in schedule updates. Whether present or not Subcontractors shall adhere to the results of the schedule updates.
- 1.32 Subcontractor has included all costs associated to meet the project schedule as defined, and including but not limited to:
  - 1.33 Costs associated with material, rental or labor escalation.
  - 1.34 Costs associated with material expediting.
  - 1.35 Costs associated with overtime, and or premium time for work that cannot be completed during normal working hours.
- 1.36 Subcontractor shall furnish all provision including, but not limited to all labor material, power, and equipment for hot and cold weather practices as required to meet the project schedule
- 1.37 Allowed weather days are included in Contractors contract with the Owner. For any additional weather days, Subcontractor shall document in writing to the Contractor on a monthly basis all days on which critical path work could not be performed due to the effects of inclement weather, in increments of ½ days. Subcontractor hereby specifically and expressly waives any monetary compensation for any weather delays. Calendar days shall be used as the basis of tracking lost days.
- 1.38 Projected weather days are incorporated into the bid/contract schedule.
- 1.39 See attached Logistics and Schedule.

## SECTION 003132 - GEOTECHNICAL DATA

### PART 1 - GENERAL

#### 1.1 GEOTECHNICAL DATA

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. A geotechnical investigation and soil-boring data report for Project, prepared by CFS Engineers, dated June 8, 2020, is attached herein as Section 003132A, for Bidders' reference.
- C. Related Requirements:
  - 1. "Instructions to Bidders" for the Bidder's responsibilities for examination of Project site and existing conditions.

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION (NOT USED)

END OF SECTION 003132





**GEOTECHNICAL EXPLORATION  
AND  
FOUNDATION RECOMMENDATIONS**

**LEE'S SUMMIT MIDDLE SCHOOL #4 - REVISED**  
**Lee's Summit, Missouri**

CFS Project No. 20-1074

**Prepared for:**

Lee's Summit R-7 School District  
301 NE Tudor Road  
Lee's Summit, Missouri 64086  
June 8, 2020



Prepared by:  
Cook, Flatt & Strobel Engineers, P.A.

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## SYNOPSIS

A subsurface exploration and an evaluation were performed at the planned Lee's Summit Middle School #4 project site to provide geotechnical engineering related recommendations for design and construction of the proposed project.

Exploratory soil borings have been drilled and a laboratory testing program was conducted on selected soil samples. The data has been analyzed based upon the project information provided DLR Group and the project team.

The results of this exploration and analysis indicate conventional spread and continuous wall footings appear to be a suitable foundation system for support of the proposed structure. However, to mitigate the risk of total and differential settlement exceeding the tolerable limits, surcharging of the building subgrade will be necessary after completion of grading operations and prior to additional loading. Alternatively, if time restrictions prohibit surcharging of the building footprint, rammed aggregate piers (RAPs) or concrete drilled piers can be utilized to support the planned structure.

Detailed analysis of subsurface conditions, any alternate foundation types, and pertinent design recommendations are included, herein.

Groundwater conditions are not expected to cause any major difficulties. These conditions will be further discussed in the report. Please note, groundwater levels should be expected to fluctuate based on seasonal changes and precipitation events.

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### Appendix A: Figures

*Figure 1 – Project Location*

*Figure 2 – Boring Location Plan*

### Appendix B: Boring Logs

### Appendix C: Portland Cement Stabilization

# Geotechnical Exploration and Foundation Recommendations

## LEE'S SUMMIT MIDDLE SCHOOL #4 - REVISED LEE'S SUMMIT, MISSOURI

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Project Number: 20-1074

May 19, 2020

### **1 INTRODUCTION**

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#### **1.1 PURPOSE**

The purpose of this geotechnical exploration was to evaluate the underlying materials at the proposed Lee's Summit Middle School #4 project site, and based upon this information, provide geotechnical engineering related recommendations for design and construction of the planned project. This exploration was performed in accordance with the requirements outlined by the project team and the Lee's Summit R-7 School district's request for proposal (RFP) number R19/20-04 titled "Geotechnical 7 Construction Testing Services" and dated March 17, 2020.

This report includes geotechnical recommendations and considerations pertaining to site development, foundation support, concrete slab on grade, pavement construction, and synthetic turf field and athletic tack subgrade support. Also, included in this report are earthwork, construction and drainage considerations associated with the proposed project.

#### **1.2 SCOPE OF SERVICES**

This exploration and analysis include an engineering reconnaissance of the planned site, a subsurface exploration as outlined below, a field and laboratory testing program, and an engineering analysis and evaluation of the subsurface materials.

The scope of services did not include any environmental assessment for wetlands or hazardous materials in the soil, surface water, groundwater, air, or surrounding area. Any statement in this report or on the boring logs regarding odors, colors, or unusual or suspicious items is strictly for the information of the client.

#### **1.3 GENERAL**

The general subsurface conditions used in this analysis are based upon an interpolation of the subsurface data between the borings; varying conditions may be encountered between boring locations. If deviations from the noted subsurface conditions are encountered during construction, they should be brought to the attention of the Geotechnical Engineer.

The recommendations submitted for the proposed structure are based on the available soil information and the preliminary design details. Any revision in the plans for the proposed structure from those



described in this report should be brought to the attention of the Geotechnical Engineer to determine if changes in the foundation recommendations are required.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, and professional advice contained, herein, have been presented after being prepared in accordance with generally accepted professional engineering practice in the fields of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

After the plans and specifications are complete, it is recommended that the Geotechnical Engineer be provided the opportunity to review the final design and specifications, in order to verify that the earthwork and foundation recommendations are properly interpreted and implemented.

## **2 PROJECT DESCRIPTION**

---

CFS Engineers understands the planned project consists of constructing a new, approximately 125,000 square feet, two-story, slab on grade middle school in Lee's Summit, Missouri with a finish floor elevation of 1011 feet above sea level. The middle school will be a combination of structural steel framing and structural concrete masonry unit (CMU) walls with anticipated typical wall and column loads on the order of five (5) kips per linear foot (klf) and 250 kips, respectively. A heavily loaded auxiliary gym (shelter area) is included in the school design with increased wall loads on the order of 12 to 15 klf.

In addition to the school building, the project comprises 4 new baseball fields with an associated concession stand building, a new football field with an athletic track, two (2) mechanically stabilized earth (MSE) retaining walls, one (1) concrete cast-in-place retaining wall, and associated parking and drive lanes. CFS understands the football field and/or baseball fields will consist of synthetic turf surfaces.

CFS understands the southeast portion of the planned structure will require fill depths on the order of approximately eleven (11) feet while the northwest corner of the planned structure will require approximately five (5) feet of cut to achieve the desired construction elevation.

If any changes to the project occur, please notify CFS to allow for review of these changes and, if necessary, amend this report.

### **2.1 SITE DESCRIPTION**

Currently, the planned site is an agricultural field that slopes downward from the northwest to the southeast. The project site is located south of the intersection of SE Bailey Road and Country Lane in Lee's Summit, Missouri. The planned site is approximately 1,000 feet wide by 2,000 feet long. It is bounded by SE Bailey Road to the north and a tree row to the east and south. The western border is a row of residential homes.

### **2.2 SITE GEOLOGY**

Jackson County is located in the Central Lowland province of the Interior Plains and is near the middle of an approximate 150 mile-wide, north-south trending band of Pennsylvanian-Age Rocks that is located in western Missouri and eastern Kansas. Generally, the rock beds exhibit a subtle prevailing dip to the west-northwest of about 10 feet per mile. The region is underlain by rock units of the Pennsylvanian

System, Missourian Series (Kansas City Group, Lansing Group, and Pleasanton Group) in the Time Stratigraphic Unit age classification.

### **3 SUBSURFACE EXPLORATION**

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Based on the project information as outlined above, CFS Engineers conducted a field exploration to determine the underlying materials at the proposed project site and to establish their engineering characteristics.

#### **3.1 SCOPE OF WORK**

This geotechnical exploration consisted of drilling thirty (30) borings throughout the planned project site. Structural borings had a planned termination depth of twenty (20) feet beneath existing grade while pavement and synthetic turf field borings had a planned termination depth of five (5) feet beneath existing grade. The borings were advanced to their planned depths or auger refusal, whichever occurred first. Fifteen (15) structural borings were drilled in the planned school's footprint, one (1) structural boring was drilled at the planned concession stand, six (6) structural borings were drilled along the retaining walls' alignment, and eight (8) pavement/turf borings were drilled in the parking and field areas. The boring locations can be seen on the Boring Location Plan included in Appendix A.

The boring locations were surveyed in the field by Cook, Flatt & Strobel Engineers. The elevation and location of the borings can be seen on the boring logs in Appendix B.

Boring logs representing the materials encountered in the borings are included in Appendix B. The boring logs represent the CFS Engineers' interpretation of the field logs combined with laboratory observations and testing of the samples. The stratification boundaries indicated on the boring logs were based on field observations, an extrapolation of information obtained by examining samples from the borings, and comparisons of soils and/or bedrock types with similar engineering characteristic. As such, the boundaries between subsurface strata should be expected to vary from the logs to some extent.

The depth to groundwater, if encountered, was recorded in each test boring during drilling and can be seen in Section 3.5, Groundwater Conditions. After completion of drilling, sampling, and field testing, the excavations were backfilled with auger cuttings.

#### **3.2 DRILLING AND SAMPLING PROCEDURES**

The auger borings were drilled using a truck mounted SIMCO 2400 drill rig equipped with a rotary head. 3.25-inch solid-stem augers were used to drill the holes. During drilling, field logs were created and maintained by CFS personnel to catalog the materials encountered.

Representative samples were obtained during drilling using split-barrel sampling procedures in general accordance with the procedures for "Standard Test Methods for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils" (ASTM D 1586).

Upon completion of drilling, the samples were then sealed and returned to CFS's laboratory for further examination, classification, and testing. The samples recovered were identified, classified, and evaluated by a Geotechnical Engineer.

### **3.3 FIELD TESTS AND MEASUREMENTS**

During the soil boring procedure, Standard Penetration Tests (SPT) were performed at pre-determined intervals to obtain the standard penetration value of the soil as outlined in the ASTM D1586 test method. The standard penetration value (N) is defined as the number of blows of a 140-pound hammer falling 30 inches, required to advance the split-barrel sampler one foot into the soil. The sampler is lowered to the bottom of the previously cleaned drill hole and advanced by blows from the hammer.

The number of blows is recorded for each of three successive increments of six inches penetration. The "N" value is then obtained by adding the second and third incremental numbers. The results of the standard penetration test are shown on the Boring Logs and indicate the relative density of cohesionless soils and comparative consistency of cohesive soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

The Standard Penetration Test (SPT) was also used to evaluate the consistency of the in-situ materials. The N-values for the site's materials were found to range from 3 to 40 blows/foot.

### **3.4 SUBSURFACE CONDITIONS**

The materials encountered in the test borings have been visually classified according to the Unified Soil Classification System (USCS). They are described on the Boring Logs in Appendix B. The results of the field tests, water level observations, and laboratory tests are presented on the Boring Logs (Appendix B).

The following presents a general summary of the major strata encountered during this subsurface exploration and includes a discussion of field and laboratory tests conducted. Specific subsurface conditions encountered—including field tests, lab tests, and water level observations—at the boring locations are also presented on the individual boring logs found in Appendix B of this report.

#### **3.4.1 Overburden Material**

Approximately twelve (12) inches of topsoil was encountered at the surface of the borings. The topsoil was generally underlain by gray-brown and gray fat clay (CH) with consistencies ranging from medium stiff to stiff. The fat clay material continued to the refusal material, occasionally taking on a shaley characteristic.

#### **3.4.2 Refusal Materials**

Auger refusal on highly weathered shale and limestone was encountered throughout the borings below the soil overburden. Some sandstone was encountered prior to refusal in some of the borings. Auger refusal was encountered at depths ranging from 7.0 to 18.75 feet beneath existing grade.

### **3.5 GROUNDWATER CONDITIONS**

Free water was encountered during drilling in borings B1, B13 and B27 at depths of 19.5, 8.5, and 13.5, respectively. The remaining borings stayed dry and no free water was encountered at the time of drilling.

Please note, the reported groundwater levels reflect the conditions observed at the time the borings were drilled. Groundwater levels should be expected to fluctuate with changes in grading, precipitation changes and seasonal changes. The water levels included in this report do not indicate a permanent

groundwater condition. Additionally, the materials encountered during this exploration are, generally, low permeable soils.

## 4 LABORATORY TESTING

Upon completion of drilling, the samples were returned to CFS's laboratory located in Kansas City, Kansas for laboratory testing. A supplemental laboratory testing program was conducted to evaluate additional engineering characteristics of the in-situ soils necessary in analyzing the behavior of the support systems for the proposed building.

The laboratory testing program included the following tests:

- Supplementary visual classification (ASTM D2488) of all samples,
- Water content (ASTM D2216) of all samples, and
- Atterberg limit tests (ASTM D4318) on a selected sample.

The results of the laboratory testing program can be seen in on the boring logs in Appendix B. The Atterberg limits can be seen in the following table.

Table 1: Atterberg Limits Results

| Boring ID | Sample # | Moisture Content (%) | Atterberg Limits |               |                  | USCS Classification      |
|-----------|----------|----------------------|------------------|---------------|------------------|--------------------------|
|           |          |                      | Liquid Limit     | Plastic limit | Plasticity Index |                          |
| B1        | SS2      | 25.0                 | 40               | 22            | 18               | LEAN CLAY (CL)           |
| B9        | SS1      | 23.0                 | 38               | 13            | 25               | LEAN CLAY (CL)           |
| B16       | SS1      | 30.0                 | 53               | 25            | 28               | FAT CLAY (CH)            |
| B25       | SS2      |                      | 46               | 19            | 27               | LEAN TO FAT CLAY (CL/CH) |
| B29       | SS1      |                      | 55               | 23            | 32               | FAT CLAY (CH)            |
| B30       | SS1      |                      | 55               | 21            | 34               | FAT CLAY (CH)            |

Based on the Atterberg limits, the gray-brown overburden material classifies as Lean Clay (CL), Lean to Fat Clay (CL/CH), and Fat Clay (CH) and is considered highly expansive. To limit the risk of differential slab movements, all concrete slabs on grade should be constructed in accordance with Section 7.2, "Slab On Grade" of this report.

## 5 GEOTECHNICAL CONCERNS

The following geotechnical concerns are based upon the subsurface materials encountered during this exploration and CFS's understanding of the project as described in Section 2, Project Description of this report. If any changes to the planned structure's location, loading or elevations occur, CFS must be allowed to review these changes, and if necessary, issue amendments to this report and its recommendations.

1. *Significant Fill Amounts:* CFS understands fill amounts of five (5) to eleven (11) feet are scheduled across the southern half of the planned new structure, while approximately four (4) feet of cut is planned in the northwest corner of the building footprint. To mitigate the risk of settlement from

the induced load attributed to the planned fill depths and to allow for utilization of shallow foundations, CFS recommends the entire building pad be surcharged upon completion of grading. The recommended surcharge load should consist of a minimum of a five (5) feet-thick layer of compacted clay soil (wet density of 120 lbs/ft<sup>3</sup>) and should remain in place for a minimum of two (2) months to allow for consolidation of the overburden materials prior to constructing the school. Settlement monitoring plates should be installed to track the consolidation process. See Section 7.1.1 for settlement monitoring recommendations. Alternatively, if time restrictions prohibit surcharging of the building footprint, rammed aggregate piers (RAPs) or concrete drilled piers can be utilized to support the planned structure.

2. *Expansive Clay Soils*: Expansive clay soils were encountered during this exploration. The on-site materials are NOT suitable for direct support of concrete slabs. All slabs on grade should be supported by a minimum 24-in-thick mat of low volume change material (LVC) constructed in accordance with Section 7.2, Slab on Grade Recommendations of this report.

## **6 EARTHWORK & SITE DEVELOPMENT**

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### **6.1 SITE PREPARATION**

Prior to filling, the grass and topsoil should be stripped from all structural areas and be stockpiled for later use in landscape areas or it should be wasted. Any trees and shrubs should be properly removed including the entirety of the root ball and root systems. The upper 12-inches of the subgrade should be moisture conditioned and recompacted, as necessary, to provide a stable subgrade upon which to begin placement of engineered fill.

Upon completion of stripping and prior to filling, the newly exposed subgrade should be evaluated by a qualified professional for stability by means of proofrolling. The proofroll should be conducted using a fully loaded, tandem axle dump truck weighing in excess of 20 tons. Any soft or unsuitable areas identified during the proofroll should be corrected by means of additional moisture conditioning and recompacting, or removal and replacement with an acceptable material.

Additionally, although not encountered during this exploration, any undocumented fill encountered during construction should be completely removed from beneath the structure footprint. Undocumented fill is any foreign material that was placed or dumped in an uncontrolled manner (i.e. no records of testing exist from the time of placement). Undocumented fill is inconsistent and unpredictable in nature, and it should not be used in support of any structures or foundation systems.

### **6.2 GRADING**

#### **6.2.1 Suitable Fill Material**

All general and structural fill should be free of debris and defined by ASTM 2487 as CH, CL, ML, GW, GP, SM, SW, SC, and SP. The onsite soils tend to meet this requirement; however, please note that CH (fat clay) classification materials should NOT be used as structural fill within two (2) feet of the finished grade supporting the building slab and within ten (10) feet laterally outside of the building footprint. Fat clays (CH) with Liquid Limits of greater than 55 should not be used in the upper one (1) foot beneath the pavement or athletic track without being treated with cement as outlined later in this report.

### 6.2.2 Unsuitable Fill Material

The on-site topsoil contains organic material and is unsuitable for use as structural fill. Unsuitable materials are those defined by ASTM 2487 as MH, OL, OH, and PT.

### 6.2.3 Engineered Fill Placement

CFS understands fill amounts on the order of five (5) to eleven (11) feet are scheduled across the southern portion of the planned new structure. To mitigate the risk of differential settlement attributed to long term consolidation of the engineered fill, any structural fill beneath the planned structure, which exceeds four (4) feet in depth, must be compacted to 98% of the materials dry unit weight as determined by standard Proctor ASTM 698. For the upper four (4) feet of building subgrade, engineered fill should be compacted to a minimum of 95% of the materials dry unit weight as determined by standard Proctor ASTM 698.

Structural fill materials should be free of organic matter. Moisture contents should be within 0% and +4% of the optimum for soils with a liquid limit of greater than 40, and +/-3% of the optimum for soils with a liquid limit of less than 40. Maximum dry density and optimum moisture content should be determined by the Standard Proctor test (ASTM D 698).

Fill should be placed in six (6) inch lifts (compacted thickness) in mass fill areas, and as needed to obtain the proper compaction in utility trenches and behind walls.

Structural fill should extend a minimum of five (5) feet laterally in all directions beyond the planned structure footprint and a minimum of two (2) feet beyond any pavement lines.

A representative of the Geotechnical Engineer should monitor filling operations on a full-time basis. A sufficient number of density tests should be taken to verify that the specified compaction is obtained. See Table 3 below for required testing frequency.

Table 2: Density Testing Frequency

| Location or Area  | Standard Proctor Density (ASTM D 698) | Testing Frequency<br>One per lift per ... |
|---|---------------------------------------|---|
| Building Walkways   | 95%                                   | 20,000 sf                                 |
| Retaining Walls   | 95%                                   | 1,000 sf                                  |
| Trenches  | 95%                                   | 150 lf                                    |
| Lawn or Unimproved Areas  | 92%                                   | 20,000 sf                                 |
| General Building and Pavement Subgrades (*)   | 95%                                   | 10,000 sf                                 |
| Out-Parcels   | 95%                                   | 20,000 sf                                 |
| *If RAPs are utilized in accordance with Section 7, compaction requirements increase to 98% for fill areas exceeding 4-feet in depth. |                                       |   |

### **6.3 EXCAVATIONS & TRENCHES**

All temporary slopes and excavations should conform to Occupational Safety and Health Administration (OSHA) Standards for the Construction Industry (29 CFR Part 1926, Subpart P). Excavations at this site are *expected* to be made in "Type B" clayey soil. Soil types should be verified in the field by a competent individual.

All excavations should be kept dry during subgrade preparation. Storm water runoff should be controlled and removed to prevent severe erosion of the subgrade and eliminate free standing water. Subgrade that has been rendered unsuitable from erosion or excessive wetting should be removed and replaced with controlled fill.

Trenches should be excavated so that pipes and culverts can be laid straight at uniform grade between the terminal elevations. Trench width should provide adequate working space and sidewall clearances. Trench subgrade should be removed and replaced with controlled fill if found to be wet, soft, loose, or frozen. Trench sub-grades should be compacted above 95% of the maximum dry density in accordance with ASTM D 698 at moisture contents between -3% to +3% of the optimum moisture content.

Granular bedding materials for pipes, such as well-graded sand or gravel, may be used provided that the bottom of the trench is graded so that water flows away from building

Bedding material should be graded to provide a continuous support beneath all points of the pipe and joints. Embedment material should be deposited and compacted uniformly and simultaneous on each side of the pipe to prevent lateral displacement. Compacted control fill material will be required for the full depth of the trench above the embedment material except in area landscape area with the compaction may be reduced to 90% Standard Proctor ASTM D 698. No backfill should be deposited or compacted in standing water.

Precautions should be taken by the contractor to avoid undermining the newly constructed foundations/rammed aggregate piers. Shoring and excavations supports may need to be designed to account for the existing building loads.

Permanent slopes greater than 3 horizontals to 1 vertical should not be used unless additional testing and slope analysis is performed.

### **6.4 DRAINAGE AND DEWATERING**

Normal seasonal weather conditions should be anticipated and planned for during earthwork. It is recommended that the Contractor determine the actual groundwater levels at the site at the time of the construction activities to assess the impact groundwater may have on construction. Water should not be allowed to collect in the foundation excavation, on floor slab areas, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of collected rainwater, groundwater, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slabs. The grades should be sloped away from the building and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the building.

The site should be graded such that positive drainage (normally 2% minimum) is provided away from any structures. Where sidewalks or paving do not immediately adjoin the building, protective slopes of at least 5% for a minimum of 10 feet from the perimeter walls are recommended. Roof drains and downpours should also be directed away from the building. Open-graded stone is not recommended for use under sidewalks unless the stone is adequately drained to prevent collection of water under the walks.

The site should also be graded to avoid water flows, concentrations, or pools behind retaining walls, curbs or similar structures. When swales are designed at the top of the walls, proper line and slope should be considered to avoid any flow down behind walls. Special attention is needed for sources of storm water from slopes, building roofs, gutter downspouts and paved areas draining to one point.

In paved areas where seasonal water potentially accumulates behind curbs, gutters and planters ensure concrete extends 6-inches into impervious material to reduce seepage under the curbs, saturating and weakening the pavement subgrade.

Perforated plastic pipes should be placed on the backfilled side of the walls near the bottom and day-lighted. Six inches of open graded crushed rock wrapped with geo-textile fabric should be placed behind the walls up to a depth of two feet below the finished grade. As an alternative to the open graded crushed rock, a manufactured geo-composite sheet drain such as Mirafi G100N, Contech C-Drain, or equivalent, may be used in conjunction with the perforated pipe.

## **6.5 LANDSCAPING**

Landscaping and irrigation should be limited adjacent to buildings and pavements to reduce the potential for large moisture changes. Trees and large bushes can develop intricate root systems that can draw moisture from the subgrade, resulting in shrinkage of the bearing material during dry periods of the year. Desiccation of bearing material below foundations may result in foundation settlement.

Landscaped areas near pavements and sidewalks should include a drainage system that prevents over saturation of the subgrade beneath asphalt and concrete surfaces. Drainage systems in irrigation areas should be incorporated into the storm drain system.

# **7 GEOTECHNICAL ENGINEERING RECOMMENDATIONS**

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## **7.1 FOUNDATIONS RECOMMENDATIONS**

Based on CFS's understand of the planned project and the large amount of fill planned beneath the proposed school, three (3) independent foundation alternatives have been provided for a cost analysis. Please note, to accommodate a shallow foundation system either surcharging of the building pad or a ground improvement system such as rammed aggregate piers prior to loading is required. If neither option is desirable, concrete drilled piers can be used to support the planned structure.

*Please note, the concession stand can be supported on shallow foundations designed and constructed as outlined below without the need for surcharging of the building pad.*



### **7.1.1 Shallow Foundations (Spread and Continuous Wall Footings)**

Conventional spread and continuous wall footings are, generally, most economical when the existing soil conditions allow them to be founded at shallow depths on existing materials. Based on the materials encountered during this exploration, it is CFS Engineers' opinion that the planned structure can be supported by a shallow foundation system, such as spread and/or trench footings bearing in native clay soils and engineered fill given the building pad has been surcharged prior to loading in accordance with this report.

CFS understands five (5) to eleven (11) feet of fill is scheduled across the southern half of the planned new structure. To mitigate the risk of differential settlement from the induced load attributed to the planned fill depths, and to allow for utilization of shallow foundations, CFS recommends the entire building pad be surcharged upon completion of grading. The recommended surcharge load should consist of a minimum five (5) feet-thick layer of compacted clay soil (wet density of 120 lbs/ft<sup>3</sup>) and should remain in place for a minimum of two (2) months to allow for consolidation of the overburden materials prior to constructing the building. Topsoil is considered a suitable material for surcharging. A settlement monitoring program as outlined below should be conducted in conjunction with surcharging.

Prior to placement of fill on the building pad, five (5) settlement plates should be installed uniformly across the pad at existing grade as directed by the Geotechnical Engineer. Rigid steel settlement plates should be a minimum of two (2) feet by two (2) feet. A rod(s) should be located in the center of the plate that extends above the proposed fill. The rod should be encapsulated by a 2 inch diameter PVC pipe to permit free movement of the plate and rod. The rods should be painted for visibility and protected from construction traffic. Settlement/movement of the plates should be performed initially prior to fill placement and twice per week by the project registered surveyor. Settlement plate elevations should be surveyed and evaluated until movement is within tolerable limits as determined by the Geotechnical Engineer.

Additionally, it is recommended that spread and trench footings have a minimum width of 24 and 16-inches, respectively. Footings should be suitably reinforced to reduce the effects of differential movement that may occur due to variations in the properties of the supporting soils. Top and bottom reinforcing steel is recommended for continuous wall footings to reduce differential settlement due to possible varying bearing capacities of the existing fill soils.

Every effort should be made to keep the footing excavations dry as the soils will tend to soften when exposed to free water. Footing bottoms should be free of loose soil and concrete should be placed as soon as possible to prevent drying of the foundation soils.

#### **7.1.1.1 *Bearing Capacity Analysis***

The bearing capacity of the subsurface materials was evaluated from the results of the field and laboratory tests. Based on this information, shallow foundation systems bearing on the surcharged subgrade, and constructed as recommended above, can be proportioned for a maximum allowable soil bearing capacity of 2,500 psf.

A representative of the Geotechnical Engineer should test the soils in the footing excavations to verify the design soils bearing pressure. If undercutting of any footing is required to reach design bearing

capacity backfill of the undercut footing should be done with a closed grade stone (such as KDOT AB-3) or lean concrete. If compacted structural fill is used to back fill the excavation, widening of the excavation one-half (1/2) the depth of the excavation on either side should be performed. The structural fill should be compacted to at least 95% of the material's maximum dry density within -2 to 3% of the optimum moisture content as determined by ASTM D-698.

Based on the seasonal freeze-thaw cycles associated with the project site, shallow foundation systems should bear a minimum of 36-inches beneath the ground surface for adequate frost protection.

#### **7.1.1.2 Settlement Analysis**

To help mitigate the risk of differential foundation movements such as settlement, the foundation system should bear on the engineered fill and native clay soils that have been surcharged appropriately. For spread and/or trench footings designed in accordance with these recommendations, total settlements of less than 1-inch and differential settlements of less than 3/4-inches can be anticipated.

### **7.1.2 Foundation Alternative 1: Rammed Aggregate Piers**

In lieu of surcharging, the existing conditions and planned project are such that a ground improvement system such as rammed aggregate piers (RAPs) are a suitable and recommended method to support conventional spread footings and the floor slab of the proposed building. Please note, CFS recommends RAPs be utilized to strengthen the in-situ soils located beneath the southern portion of the planned structure (including slab on grade area) where the scheduled amount of fill will exceed four (4) feet in depth.

Please note, to mitigate the risk of differential settlement attributed to long term consolidation of the engineered fill, any structural fill beneath the planned structure, which exceeds four (4) feet in depth, must be compacted to 98% of the materials dry unit weight as determined by ASTM 698. For the upper four (4) feet of building subgrade, engineered fill should be compacted to a minimum of 95% of the materials dry unit weight as determined by ASTM 698.

RAPs are used to improve the load carrying capacity of soils by ramming aggregate into the unstable subgrade. Generally, a hole is first drilled into the subgrade and successive layers of aggregate are placed and driven into the unstable soils forming an "aggregate bulb" at the base, and thus providing lateral and vertical strengthening of the existing materials. RAPs are a patented design-build intermediate foundation system. The respective companies should be contacted to design the foundation system.

Although final design and analysis must be conducted by RAPs contractor/engineer, typical bearing capacities achieved by this rammed aggregate piers are on the order of 3,000 to 5,000 pounds per square foot (psf) with settlements on the order of 1-inch for total settlement and 1/2-inch for differential settlement.

In conjunction with the recommended ground improvement system, it is recommended that spread and trench footings be designed and constructed as outlined in Section 7.1.1.

### **7.1.3 Foundation Alternative 2: Concrete Drilled Piers**

In lieu of rammed aggregate piers and surcharging the building pad, a deep foundation system such as drilled concrete piers can be utilized to support the foundation system and slab on grade. A structural slab beneath may be required to achieve this. Drilled piers are used most advantageously where a soft or unsuitable soil strata overlies a hard foundation material. Soil conditions and the magnitude of the proposed loads indicate that drilled piers would be a suitable foundation system.

Limestone and shale bedrock were encountered throughout this exploration at relatively shallow depths (Reference the boring logs in Appendix B). Drilled piers should bear on competent limestone using a maximum allowable end bearing pressure of 20 kips per square foot (ksf). Drilled piers should extend through all upper broken limestone and shale layers and be socketed a minimum of two (2) feet or one (1) pier diameter, whichever is more, into competent limestone. Piers should be suitably reinforced to resist lateral movement. A representative of the geotechnical engineer should be in the field to evaluate embedment and a suitable bearing stratum has been reached. Down hole inspection is not anticipated to be required by the inspector.

Please note, shallow groundwater and wet, soft soils were and are often encountered above the restrictive bearing layer (rock). The contractor should have equipment onsite to dewater the pier excavation and/or prevent sloughing of wet, soft soils into the excavation in case it becomes necessary. Temporary steel casing may be required in some holes to prevent sloughing of the upper soils and to permit down-hole cleaning and inspection (if required). Conventional drilling equipment with bullet nose rock teeth is expected to be able to penetrate the upper soils and reach the bearing surface. Coring is not expected to be required to reach the limestone.

A minimum shaft diameter of 30 inches is recommended to facilitate clean out and inspection. Drilling of test holes is not required, however the contractor should provide a price for tests holes should rock conditions dictate further investigation to confirm design parameters. The bottom of the hole should be free of water and loose soils prior to placement of reinforcing steel and concrete.

To help mitigate the risk of differential foundation movements such as settlement, a uniform bearing condition should exist beneath the entirety of the foundation system for a given structure. For a drilled pier foundation system, total settlements of less than ½ -inch and differential settlements of less than ½ -inch can be anticipated.

### **7.1.4 Seismic Analysis**

The typical profile at this site consists of soil to a depth of six (6) to 18 feet where bedrock /was encountered. The seismic properties of the soil were interpolated from the standard penetration test values. A Seismic Site Class "C" was determined for this site. In addition, there is no significant risk of liquefaction or mass movement of the on-site soils due to a seismic event.

## **7.2 SLAB ON GRADE RECOMMENDATIONS**

CFS recommends all concrete slabs on grade be supported by a minimum of 24-inches of Low Volume Change (LVC) material. LVC material should consist of lean clay (CL), KDOT AB3, crushed limestone

screenings or equivalent. A low volume change material is defined as a material with a liquid limit less than 45 and a plasticity index less than 25. The subgrade can be constructed as outlined below.

1. Cut the subgrade to a minimum depth of 24-inches beneath the planned bottom of slab elevation.
2. Twenty (20) inches of a compacted LCV material should be placed atop the exposed slab subgrade. The LVC should be placed in lifts no greater than 8-inches-thick (compacted thickness) and compacted to 95% of the maximum dry density as determined by ASTM 698. Limestone based LVC material should be compacted at a moisture content sufficient to achieve the desired compaction, and lean clay (CL) material should be compacted at a moisture content between 0 and +4% of optimum.
3. A 4-inch-thick layer of open graded stone (ASTM C33 or equivalent material) should be placed atop the 20-inches of compacted LVC material to return the subgrade to the original bottom of slab elevation. The open-graded stone will ease construction and provide a capillary break between the LVC and concrete slab.

Every floor slab should be evaluated to determine if a vapor retarder under the concrete floor is required. The slab designer should refer to ACI 302 and/or ACI 360 for procedures regarding the use and placement of a vapor retarder.

To reduce the effects of differential movement, slabs-on-grade should not be rigidly connected to columns, walls, or foundations unless it is designed to withstand the additional resultant forces. Floor slabs should not extend beneath exterior doors or over foundation grade beams, unless saw cut at the beam after construction. Expansion joints may be used to allow unrestrained vertical movement of the slabs. The floor slabs should be designed to have an adequate number of joints to reduce cracking resulting from differential movement and shrinkage. CFS suggests joints be provided on a minimum spacing of twelve (12) feet on center. For additional recommendations refer to the ACI Design Manual. The requirements for the slab reinforcement should be established by the designer based on experience and the intended slab use.

### **7.3 LATERAL EARTH PRESSURES**

Lateral earth pressures are determined by multiplying the vertical applied pressure by the appropriate lateral earth pressure coefficient. If the foundation walls are rigidly attached to the building and not free to rotate or deflect at the top, CFS recommends designing the walls for the *at-rest* earth pressure coefficient. Walls that are permitted to rotate and deflect at the top can be designed for the *active* lateral earth pressure condition. Horizontal loads acting on shallow foundations are resisted by friction along the foundation base and by *passive* pressure against the footing face that is perpendicular to the line of applied force.

Table 3: Earth Pressure and Friction Coefficients

|                                       | Active<br>(K <sub>a</sub> ) | Passive<br>(K <sub>p</sub> ) | At-Rest<br>(K <sub>o</sub> ) | Allowable<br>Base<br>Friction | Unit Weight<br>(pcf) |
|---------------------------------------|-----------------------------|------------------------------|------------------------------|-------------------------------|----------------------|
| Open-graded crushed limestone         | 0.27                        | 3.69                         | 0.43                         | 0.47                          | 130-140              |
| In-situ lean clay soils               | 0.40                        | 2.5                          | 0.68                         | 0.32                          | 95-115               |
| In-situ fat clay soils                | 0.49                        | 2.04                         | 0.66                         | 0.24                          | 90-110               |
| Lean clay – conditioned and compacted | 0.32                        | 3.12                         | 0.48                         | 0.35                          | 95-115               |
| Fat clay – conditioned and compacted  | 0.45                        | 2.2                          | 0.63                         | 0.27                          | 90-110               |

These earth pressure coefficients do not include the effect of surcharge loads, hydrostatic loading, or a sloping backfill. Nor do they incorporate a factor of safety. Also, these earth pressure coefficients do not account for high lateral pressures that may result from volume changes when expansive clay soils are used as backfill behind walls with unbalanced fill depths. In addition, any disturbed soils that are relied upon to provide some level of passive resistance should be placed in lifts not exceeding six (6) inches in thickness and compacted to a minimum density of 95% of the Standard Proctor (ASTM D698) maximum dry density at a moisture content within +/- 3% of the optimum moisture content. It is recommended that a representative of CFS should verify the compaction of any such materials relied upon to provide passive pressure.

The actual earth pressure on the walls will vary according to material types and backfill materials used and how the backfill is compacted. If the backfill conditions are different than the ones used above, CFS should be notified so the recommendations can be modified. The buildup of water behind a wall will increase the lateral pressure imposed on below-grade walls. Adequate drainage should be provided behind any below grade walls as described in this report. The walls should also be designed for appropriate surcharge pressures such as adjacent traffic, interior building floor slab loads, and construction equipment.

## 7.4 SYNTHETIC TURF FIELDS & ATHLETIC TRACK RECOMMENDATIONS

CFS understands the project requirements include restricting the synthetic turf fields to less than ½-inch of vertical movement, if possible, and little to no movement tolerance for the athletic track. The in-situ materials encountered beneath the planned synthetic turf fields and the athletic track, generally, consist of Fat Clay (CH) materials. Fat clay is considered highly expansive, and as such, is susceptible to significant volume changes with changes in moisture. To limit movements to tolerable amounts, it is recommended that the synthetic turf fields and the athletic track be supported by a minimum 9-inch-thick Portland cement stabilized subgrade. Where possible, the cement stabilized subgrade layers should extend at least five (5) feet beyond all boundary lines. The surfaces should be sloped accordingly to allow for proper shedding of all water during a precipitation event. Proper drainage and dewatering

measures should be implemented to prevent water infiltration of the subgrade. Additionally, the track and turf manufacturers should be consulted prior to construction and CFS should be allowed to review final design to evaluate potential geotechnical related concerns. Reference Table 4 for the recommended thicknesses of the athletic track.

*Table 4: Athletic Track Section*

| <b>Recommended Thicknesses (inches)</b> |   |
|---|---|
| APWA Type 3-01 AC Surface               | 2 |
| APWA Type 1-01 AC Base                  | 3 |
| Portland Cement Stabilized Subgrade     | 9 |

Portland cement should be thoroughly mixed with the existing subgrade materials to the recommended depths given above at a concentration of 5% by dry unit weight of the in-situ materials dry unit weight. Water should be added, as necessary, to hydrate the cement. The mixture should be compacted to a minimum of 98% of the combined materials dry unit weight at a moisture content between 0 and +3% of the optimum moisture content as determined by ASTM D698. The specified compaction should be achieved within two (2) hours of the materials being combined and hydrated.

It is recommended that the subgrade be hydrated daily and protected from drying for the first five (5) days after stabilization occurs. Additionally, CFS recommends microcracking of the subgrade be completed by a vibratory, sheep's foot roller 36 to 48 hours after completion of stabilization. Microcracking will reduce the risk of water conduits forming in the subgrade as a result of shrinkage cracks that may develop during the cement curing period. Except for water trucks and microcracking equipment, the subgrade should be protected from all loading and construction traffic for a minimum of five (5) days. Reference Appendix C for more information on cement stabilization.

## **7.5 PAVEMENT RECOMMENDATIONS**

The pavement sections presented below are considered typical and minimum for the report basis parameters. The client should be aware that thinner pavement sections might result in increased maintenance costs and lower than anticipated pavement life. The pavement area subgrade consists of moisture sensitive soils.

The soils expected beneath the pavement are fine silty sands to clayey silts to silty clays. Should the clayey silts to silty clays be the pavement subgrade, they tend to expand and contract with changes in moisture and weather conditions and are very moisture susceptible, losing strength quickly. The on-site silts and clays can be stabilized with 5% by weight Portland Type 1/2 Cement for a depth of nine (9) inches, constructed as outlined in Section 7.4, to extend the life of the pavement.

Table 5: Recommended Light Duty Pavement Sections (Parking lots)

| Recommended Thicknesses (inches)                            |    |   |    |
|---|----|---|----|
| Asphalt   |    | Concrete  |    |
| APWA Type 3-01 AC Surface                                   | 2  | Concrete  | 5  |
| APWA Type 1-01 AC Base                                      | 3  | Aggregate Base Course                                       | 4  |
| Aggregate Base Course                                       | 6  | Moisture Conditioned & Recompacted Subgrade (Section 7.4.4) | 12 |
| Moisture Conditioned & Recompacted Subgrade (Section 7.4.4) | 12 |   |    |

Table 6: Heavy Duty Pavement Thicknesses (Truck areas and drives)

| Recommended Thicknesses (inches)                            |    |   |    |
|---|----|---|----|
| Asphalt   |    | Concrete  |    |
| APWA Type 3-01 AC Surface                                   | 2  | Concrete  | 7  |
| APWA Type 1-01 AC Base                                      | 6  | Aggregate Base Course                                       | 4  |
| Aggregate Base Course                                       | 6  | Moisture Conditioned & Recompacted Subgrade (Section 7.4.4) | 12 |
| Moisture Conditioned & Recompacted Subgrade (Section 7.4.4) | 12 |   |    |

Note: When base is to be placed in the fall and surface in the spring, APWA Type 2-01 is recommended to improve performance of base due to lower permeability. Eight (8) inches of concrete and four (4) inches of base rock is recommended for trash and/or recycling dumpster areas.

### 7.5.1 Asphalt Pavement Construction

The granular base course should be built at least 2 feet wider than the pavement on each side to support the tracks of the slip form paver. This extra width is structurally beneficial for wheel loads applied at pavement edge.

Asphalt cement (bitumen) used in the manufacture of asphalt pavement should conform to the Performance Grading system. In the project area, the provincial grade asphalt binder course is PG 64-22. The asphaltic mix for conventional roadway should be designed for 4% air voids. During production, the voids can be expected to vary  $\pm 1\%$  of the design value of 4%. Under these conditions, the minimum allowable VMA for base and surface course shall be 12% and 14%, respectively.

Immediately after spreading, each course of the pavement mixture should be compacted by rolling. The initial or "breakdown" rolling shall be accomplished with a steel-wheeled vibratory roller. The motion of the roller should be slow enough at all times to avoid displacement of the hot mixture. The surface of the mixture after compaction should be smooth and true to established section and grade. The completed asphalt concrete paving should have a density equal to or greater than 95% for the base and 96% for the surface of theoretical density.

All asphaltic concrete mix designs and Marshall Characteristics should be submitted to our office and reviewed in order to determine if they are consistent with the recommendations given in this report.

All materials to be employed and field operations required in connection with the pavement reconstruction should follow requirements and procedural details as per APWA 2001. In addition, representative of CFS should observe and monitor the pavement construction to assure satisfactory compliance with our engineering recommendations.

### **7.5.2 Concrete Pavement Construction**

The pavement on this site will be subjected to freeze-thaw cycles. Sufficient air entrainment in the range of 6% to 8% is required to provide freeze-thaw durability in the concrete. Concrete with a 28-day specified compressive strength of 4,000 psi is recommended. The concrete mix should contain at least 564 pounds of concrete per cubic yard. A mixture with a maximum slump of 4 inch +/- 1 inch is acceptable. If a water-reducing admixture is specified, slump can be higher. For better performance and crack control, synthetic fiber reinforcement such as Fibermesh® 300 is recommended for the concrete instead of welded wire mesh. Add synthetic fiber reinforcement to concrete mixture in accordance with manufacturer's instructions.

### **7.5.3 Pavement Subgrade Preparation**

The upper 12 inches of exposed subgrade, extended a minimum of two (2) feet laterally beyond all pavement lines, should be moisture conditioned and recompact, as necessary, to pass a proofroll evaluation as described in Section 6.1, "Site preparation" of this report.

Any localized soft, wet, or loose areas identified during the proof rolling should be repaired prior to paving. Fill material should be placed in loose lifts up to a maximum of eight (8) inches in thickness and compacted to at least 95% of the maximum dry density in accordance with ASTM D698 at moisture contents outlined in the Earthwork section. Construction traffic, including foot traffic, should be minimized to prevent unnecessary disturbance of the pavement subgrade. Disturbed areas, as verified by CFS's geotechnical engineer, should be removed and replaced with properly compacted material.

Fat clays (CH) with Liquid Limits of greater than 55 should not be used in the upper one (1) foot beneath the pavement without being treated with a nine (9) inch layer of cement as outlined previously in this report. Consideration should be given to treating all non-LVC clays so as to extend the life of the pavement, improve performance and reduce maintenance costs.

The granular base should be placed in loose lifts up to a maximum of twelve (12) inches in thickness a minimum lateral distance of two (2) feet beyond the pavement, and compacted to at least 98% of the maximum dry density in accordance with ASTM D698.

If open graded stone is used under the pavement, the pavement subgrade should be graded to provide positive drainage of the granular base section. Provision should be made to provide drainage into the storm water system. The use of a granular blanket drain near storm water inlets that provides weep holes from the drain to the inlets is recommended.



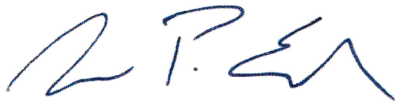
## 8 GENERAL COMMENTS

When the plans and specifications are complete, or if significant changes are made in the character or location of the proposed building, a consultation should be arranged to review the changes with respect to the prevailing soil conditions. At that time, it may be necessary to submit supplementary recommendations.

It is recommended that the services of Cook, Flatt & Strobel Engineers be engaged to test and evaluate the compaction of any additional fill materials and to test and evaluate the bearing value of the soils in the footing excavations.

Respectfully submitted,

COOK, FLATT & STROBEL ENGINEERS, P.A.

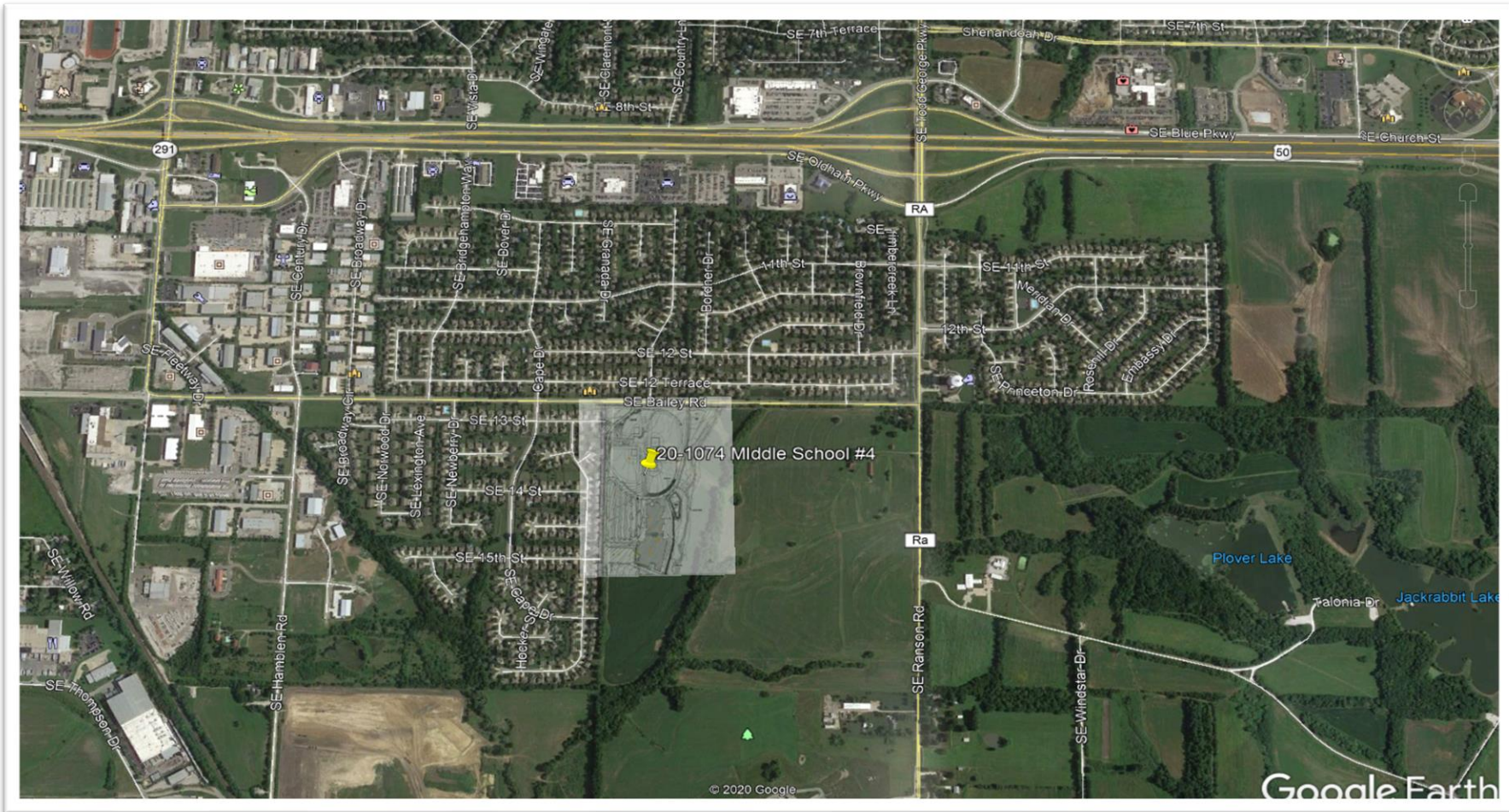


Jacob Engler, P.E.  
Geotechnical Engineer



Adam McEachron, P.E.  
Senior Geotechnical Engineer

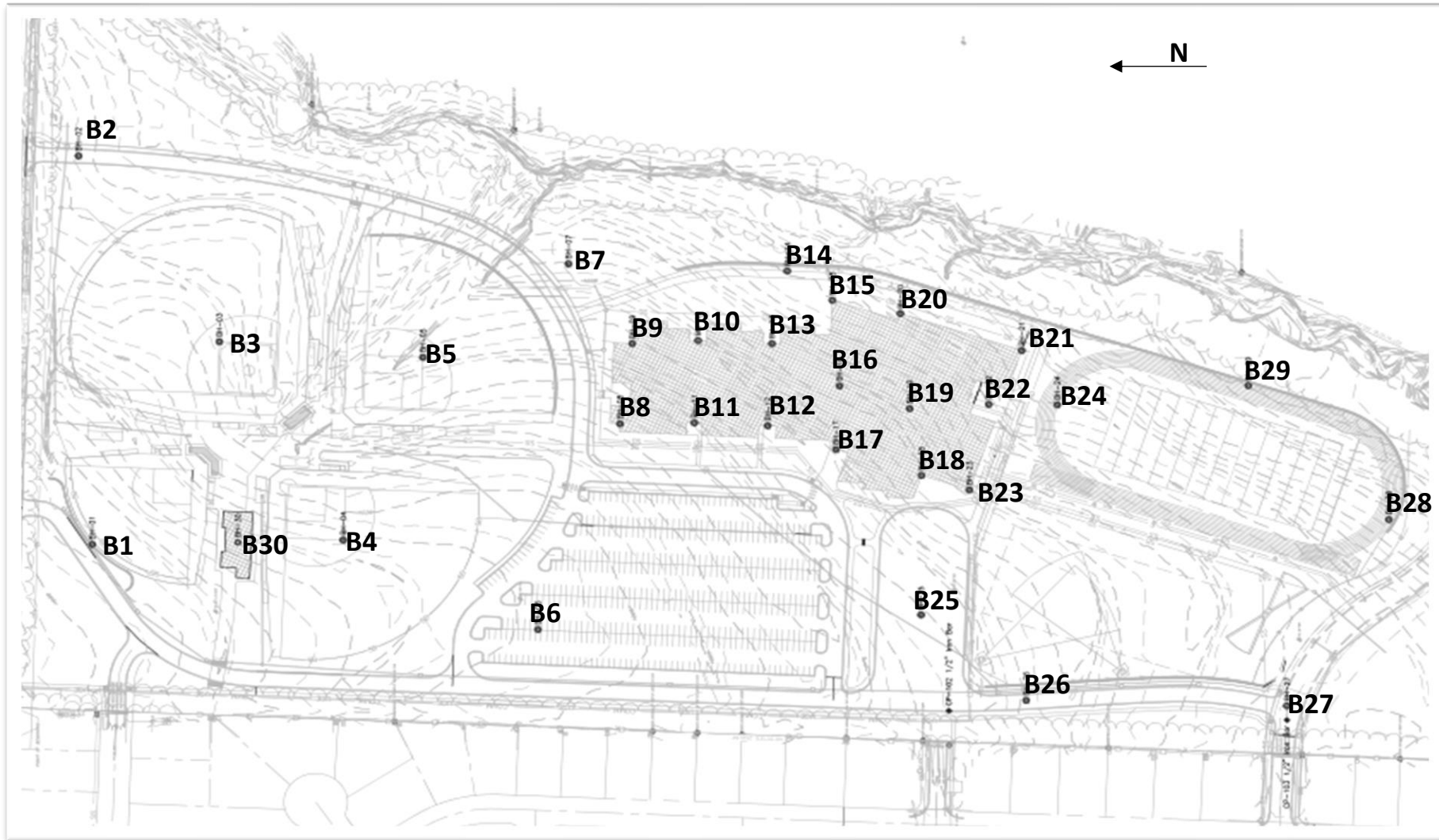
## **Appendix A: Figures**



1100 W. Cambridge Circle Dr, Ste 700  
Kansas City, Kansas 66103

|   |                    |                                     |
|---|--------------------|-------------------------------------|
| Project: <b>LEE'S SUMMIT MIDDLE SCHOOL #4</b> | Project #: 20-1074 | Figure 1: <b>SITE LOCATION PLAN</b> |
| Project Location: Lee's Summit, MO            | Comments:          |                                     |
| Client: Lee's Summit R7 School District       |                    |                                     |
| Date: 5/19/2020                               |                    |                                     |





1100 W. Cambridge Circle Dr, Ste 700  
Kansas City, Kansas 66103

Project: **LEE'S SUMMIT MIDDLE  
SCHOOL #4**

Project Location: Lee's Summit, MO

Client: Lee's Summit R7 School District

Date: 5/19/2020

Project #: 20-1074

Comments:

Figure 2: **BORING LOCATION  
PLAN**

## **Appendix B: Boring Logs**



CFS Engineers, Inc  
1100 W. Cambridge Circle Drive, Suite 700  
Kansas City, Kansas 66103

# BORING NUMBER B1

PAGE 1 OF 1

|                     |                                  |                      |                               |
|---------------------|----------------------------------|----------------------|-------------------------------|
| CLIENT              | Lee's Summit R-7 School District | PROJECT NAME         | Lee's Summit Middle School #4 |
| PROJECT NUMBER      | 20-1074                          | PROJECT LOCATION     | Lee's Summit, Missouri        |
| DATE STARTED        | 04/30/20                         | COMPLETED            | 04/30/20                      |
| DRILLING CONTRACTOR | CFS Engineers                    | GROUND ELEVATION     | 1027.142 ft                   |
| DRILLING METHOD     | 3.25-inch Continuous Flight      | HOLE SIZE            | 3.25 inches                   |
| LOGGED BY           | TP                               | CHECKED BY           | JE                            |
| NOTES               |                                  |                      |                               |
|                     |                                  | GROUND WATER LEVELS: |                               |
|                     |                                  | AT TIME OF DRILLING  | --- Not Recorded              |
|                     |                                  | AT END OF DRILLING   | --- Not Recorded              |
|                     |                                  | AFTER DRILLING       | 18.50 ft / Elev 1008.64 ft    |

| DEPTH<br>(ft)   | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|   |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0   |                | TOPSOIL with vegetation   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                | (CL) gray-brown, medium stiff LEAN CLAY with iron nodules                               | SPT 1                 | 100                 | 2-3-4<br>(7)                |                      |                       | 26                      |                     |                  |                     |                      |
|   |                | (CH) gray-brown and gray mottled reddish brown, medium stiff FAT CLAY with iron nodules |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
| 5   |                |   | SPT 2                 | 100                 | 2-3-4<br>(7)                |                      |                       | 25                      | 40                  | 22               | 18                  |                      |
|   |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                |   | SPT 3                 | 100                 | 2-3-4<br>(7)                |                      |                       | 22                      |                     |                  |                     |                      |
|   |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
| 10  |                | stiff below 8.5'  | SPT 4                 | 100                 | 2-4-5<br>(9)                |                      |                       | 27                      |                     |                  |                     |                      |
|   |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
| 15  |                |   | SPT 5                 | 100                 | 3-5-6<br>(11)               |                      |                       | 22                      |                     |                  |                     |                      |
|   |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                | tan, highly weathered SANDSTONE, clayey   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                |   | SPT 6                 | 100                 | 50/3"                       |                      |                       |                         |                     |                  |                     |                      |
| Refusal at 18.8 feet.<br>Bottom of borehole at 18.8 feet. |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

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1100 W. Cambridge Circle Drive, Suite 700  
Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 04/30/20 COMPLETED 04/30/20

GROUND ELEVATION 1012.351 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION   | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown and gray mottled reddish brown, medium stiff<br>FAT CLAY with iron nodules | SPT<br>1              | 100                 | 1-2-4<br>(6)                | 3.25                 |                       | 25                      |                     |                  |                     |                      |
|               |                |  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                |  | SPT<br>2              | 100                 | 2-3-4<br>(7)                | 2                    |                       | 27                      |                     |                  |                     |                      |
| 5             |                |  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Bottom of borehole at 5.0 feet.



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Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 04/30/20 COMPLETED 04/30/20

GROUND ELEVATION 1016.143 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown and gray, medium stiff FAT CLAY with iron nodules | SPT 1                 | 94                  | 1-2-4<br>(6)                | 3.5                  |                       | 27                      |                     |                  |                     |                      |
|               |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                |   | SPT 2                 | 100                 | 2-3-4<br>(7)                | 4.25                 |                       | 25                      |                     |                  |                     |                      |
| 5             |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Bottom of borehole at 5.0 feet.







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CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 04/30/20 COMPLETED 04/30/20

GROUND ELEVATION 1010.145 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown and gray, medium stiff FAT CLAY with iron nodules | SPT 1                 | 97                  | 2-4-4<br>(8)                | 3.25                 |                       | 22                      |                     |                  |                     |                      |
| 5             |                |   | SPT 2                 | 100                 | 2-2-4<br>(6)                |                      |                       | 17                      |                     |                  |                     |                      |

Bottom of borehole at 5.0 feet.



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Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 04/30/20 COMPLETED 04/30/20

GROUND ELEVATION 1021.25 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

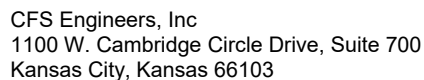
AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                       |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) dark gray-brown, medium stiff FAT CLAY with iron nodules | SPT<br>1              | 94                  | 2-2-4<br>(6)                | 2.5                  |                       | 29                      |                     |                  |                     |                      |
|               |                | gray-brown, gray and reddish brown below 3.5'                 | SPT<br>2              | 100                 | 2-2-4<br>(6)                | 3                    |                       | 27                      |                     |                  |                     |                      |
| 5             |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Bottom of borehole at 5.0 feet.



## PAGE 1 OF 1

|  |  |
|--|--|
| <b>CLIENT</b> <u>Lee's Summit R-7 School District</u>                | <b>PROJECT NAME</b> <u>Lee's Summit Middle School #4</u>                       |
| <b>PROJECT NUMBER</b> <u>20-1074</u>                                 | <b>PROJECT LOCATION</b> <u>Lee's Summit, Missouri</u>                          |
| <b>DATE STARTED</b> <u>05/10/20</u> <b>COMPLETED</b> <u>05/10/20</u> | <b>GROUND ELEVATION</b> <u>1005.888 ft</u> <b>HOLE SIZE</b> <u>3.25 inches</u> |
| <b>DRILLING CONTRACTOR</b> <u>CFS Engineers</u>                      | <b>GROUND WATER LEVELS:</b>  |
| <b>DRILLING METHOD</b> <u>3.25-inch Continuous Flight</u>            | <b>AT TIME OF DRILLING</b> <u>--- No Free Water Encountered</u>                |
| <b>LOGGED BY</b> <u>TP</u> <b>CHECKED BY</b> <u>JE</u>               | <b>AT END OF DRILLING</b> <u>--- No Free Water Encountered</u>                 |
| <b>NOTES</b>   | <b>AFTER DRILLING</b> <u>--- No Free Water Encountered</u>                     |

| DEPTH<br>(ft) | GRAPHIC LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE NUMBER | RECOVERY %<br>(RQD) | BLOW COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE CONTENT (%) | ATTERBERG LIMITS |               |                  | FINES CONTENT (%) |
|---------------|-------------|---|--------------------|---------------------|--------------------------|----------------------|-----------------------|----------------------|------------------|---------------|------------------|-------------------|
|               |             |   |                    |                     |                          |                      |                       |                      | LIQUID LIMIT     | PLASTIC LIMIT | PLASTICITY INDEX |                   |
|               |             |   |                    |                     |                          |                      |                       |                      |                  |               |                  |                   |
| 0             |             | TOPSOIL with vegetation                                       |                    |                     |                          |                      |                       |                      |                  |               |                  |                   |
|               |             | (CH) dark gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1              | 89                  | 2-3-5<br>(8)             | 3                    |                       | 25                   |                  |               |                  |                   |
| 5             |             | gray-brown, gray and reddish brown below 3.5'                 | SPT 2              | 89                  | 2-3-4<br>(7)             | 2.75                 |                       | 25                   |                  |               |                  |                   |

Bottom of borehole at 5.0 feet.



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## BORING NUMBER B8

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CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 04/30/20 COMPLETED 04/30/20

GROUND ELEVATION 1015.079 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

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| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                     |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown, stiff FAT CLAY with iron nodules           | SPT 1                 | 100                 | 2-3-5<br>(8)                | 3                    |                       | 26                      |                     |                  |                     |                      |
|               |                | gray-brown, gray and reddish brown, medium stiff below 3.5' | SPT 2                 | 100                 | 2-3-4<br>(7)                | 3.5                  |                       | 20                      |                     |                  |                     |                      |
| 5             |                | stiff below 6'  | SPT 3                 | 100                 | 2-3-5<br>(8)                | 4.5                  |                       | 25                      |                     |                  |                     |                      |
|               |                | medium stiff below 8.5'                                     | SPT 4                 | 100                 | 2-2-3<br>(5)                | 3.5                  |                       | 25                      |                     |                  |                     |                      |
| 10            |                | trace of fine sand below 13.5'                              | SPT 5                 | 88                  | 3-5-50/5"                   | 4.5                  |                       | 22                      |                     |                  |                     |                      |
| 15            |                | highly weathered SANDSTONE                                  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | highly weathered LIMESTONE                                  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Refusal at 15.2 feet.  
Bottom of borehole at 15.2 feet.



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CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/10/20 COMPLETED 05/10/20

GROUND ELEVATION 1009.821 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

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| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CL) gray-brown, medium stiff LEAN CLAY with iron nodules                 | SPT 1                 | 100                 | 2-4-5<br>(9)                | 3.5                  |                       | 23                      | 38                  | 13               | 25                  |                      |
|               |                | (CH) gray-brown, gray and reddish brown, stiff FAT CLAY with iron nodules | SPT 2                 | 100                 | 2-3-5<br>(8)                | 4.25                 |                       | 21                      |                     |                  |                     |                      |
| 5             |                |   | SPT 3                 | 100                 | 2-3-5<br>(8)                | 4.5                  |                       | 25                      |                     |                  |                     |                      |
|               |                |   | SPT 4                 | 100                 | 2-3-12<br>(15)              | 4.5                  |                       | 23                      |                     |                  |                     |                      |
| 10            |                | highly weathered limestone fragments below 10'                            |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | highly weathered LIMESTONE  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Refusal at 10.5 feet.  
Bottom of borehole at 10.5 feet.





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CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 04/30/20 COMPLETED 04/30/20

GROUND ELEVATION 1014.085 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

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| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                       |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) dark gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 78                  | 2-3-4<br>(7)                | 2.5                  |                       | 27                      |                     |                  |                     |                      |
| 5             |                | gray-brown, gray and reddish brown, stiff below 3.5'          | SPT 2                 | 100                 | 2-3-5<br>(8)                | 2.75                 |                       | 25                      |                     |                  |                     |                      |
|               |                |   | SPT 3                 | 100                 | 2-3-5<br>(8)                | 4                    |                       | 21                      |                     |                  |                     |                      |
| 10            |                |   | SPT 4                 | 100                 | 2-3-4<br>(7)                | 2.5                  |                       | 32                      |                     |                  |                     |                      |
|               |                |   | SPT 5                 | 100                 | 3-50/1"                     | 3.5                  |                       | 27                      |                     |                  |                     |                      |
|               |                | highly weathered LIMESTONE                                    |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Refusal at 14.3 feet.  
Bottom of borehole at 14.3 feet.





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Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/07/20 COMPLETED 05/07/20

GROUND ELEVATION 1010.193 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION                                     | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 100                 | 1-2-4<br>(6)                | 3                    |                       | 28                      |                     |                  |                     |                      |
| 5             |                | gray-brown, gray and reddish brown below 3.5'            | SPT 2                 | 100                 | 2-2-3<br>(5)                | 3                    |                       | 23                      |                     |                  |                     |                      |
|               |                |  | SPT 3                 | 100                 | 2-2-4<br>(6)                | 2.25                 |                       | 31                      |                     |                  |                     |                      |
| 10            |                |  | SPT 4                 | 100                 | 2-3-4<br>(7)                | 2.25                 |                       | 29                      |                     |                  |                     |                      |

Refusal at 13.5 feet.  
Bottom of borehole at 13.5 feet.



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CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/10/20 COMPLETED 05/10/20

GROUND ELEVATION 1004.54 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- Not Recorded

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- Not Recorded

NOTES

▼ AFTER DRILLING 8.50 ft / Elev 996.04 ft

| DEPTH<br>(ft)   | GRAPHIC<br>LOG | MATERIAL DESCRIPTION                              | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|   |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0   |                | TOPSOIL with vegetation                           |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                | (CH) gray-brown, stiff FAT CLAY with iron nodules | SPT 1                 | 100                 | 2-4-4<br>(8)                | 3.75                 |                       | 22                      |                     |                  |                     |                      |
|   |                | gray-brown, gray and reddish brown below 3.5'     | SPT 2                 | 100                 | 2-3-6<br>(9)                | 4.25                 |                       | 23                      |                     |                  |                     |                      |
| 5   |                | medium stiff below 6'                             | SPT 3                 | 100                 | 1-3-4<br>(7)                | 4.25                 |                       | 25                      |                     |                  |                     |                      |
|   |                |   | SPT 4                 | 100                 | 1-2-3<br>(5)                | 2.5                  |                       | 34                      |                     |                  |                     |                      |
| 10  |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                | tan and gray, highly weathered SHALE              | SPT 5                 | 100                 | 9-13-15<br>(28)             |                      |                       | 23                      |                     |                  |                     |                      |
| 15  |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                | highly weathered LIMESTONE                        |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
| Refusal at 18.0 feet.<br>Bottom of borehole at 18.0 feet. |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

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Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/10/20 COMPLETED 05/10/20

GROUND ELEVATION 999.561 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                       |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) dark gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 78                  | 1-3-3<br>(6)                | 2.5                  |                       | 29                      |                     |                  |                     |                      |
|               |                | gray-brown, gray and reddish brown below 3.5'                 | SPT 2                 | 94                  | 2-2-3<br>(5)                | 3                    |                       | 26                      |                     |                  |                     |                      |
| 5             |                |   | SPT 3                 | 100                 | 2-2-4<br>(6)                | 3.5                  |                       | 26                      |                     |                  |                     |                      |
|               |                | stiff and shaley below 8.5'                                   | SPT 4                 | 100                 | 2-4-8<br>(12)               |                      |                       | 27                      |                     |                  |                     |                      |
| 10            |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | highly weathered LIMESTONE                                    |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Refusal at 13.2 feet.  
Bottom of borehole at 13.2 feet.



CFS Engineers, Inc  
1100 W. Cambridge Circle Drive, Suite 700  
Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/10/20 COMPLETED 05/10/20

GROUND ELEVATION 999.6 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 05/19/20 15:10 - G:\SHARED DRIVES\201074\GEOTECH\EXPLORATION REPORTS\20-1074 LOGS V2.GPJ

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                       |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) dark gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 97                  | 2-3-4<br>(7)                | 3.5                  |                       | 26                      |                     |                  |                     |                      |
|               |                | gray-brown, gray and reddish brown below 3.5'                 | SPT 2                 | 89                  | 1-2-3<br>(5)                | 2.75                 |                       | 29                      |                     |                  |                     |                      |
| 5             |                |   | SPT 3                 | 100                 | 2-2-3<br>(5)                | 2.75                 |                       | 34                      |                     |                  |                     |                      |
|               |                | shaley below 8.5'   | SPT 4                 | 94                  | 2-3-4<br>(7)                | 4.5+                 |                       | 30                      |                     |                  |                     |                      |
| 10            |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Refusal at 13.0 feet.  
Bottom of borehole at 13.0 feet.





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# BORING NUMBER B17

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|                     |                                  |   |                               |
|---------------------|----------------------------------|---|-------------------------------|
| CLIENT              | Lee's Summit R-7 School District | PROJECT NAME                                      | Lee's Summit Middle School #4 |
| PROJECT NUMBER      | 20-1074                          | PROJECT LOCATION                                  | Lee's Summit, Missouri        |
| DATE STARTED        | 05/07/20                         | COMPLETED   | 05/07/20                      |
| GROUND ELEVATION    | 1008.754 ft                      | HOLE SIZE   | 3.25 inches                   |
| DRILLING CONTRACTOR | CFS Engineers                    | GROUND WATER LEVELS:                              |                               |
| DRILLING METHOD     | 3.25-inch Continuous Flight      | AT TIME OF DRILLING --- No Free Water Encountered |                               |
| LOGGED BY           | TP                               | AT END OF DRILLING --- No Free Water Encountered  |                               |
| CHECKED BY          | JE                               | AFTER DRILLING --- No Free Water Encountered      |                               |
| NOTES               |                                  |   |                               |

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION                                     | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 89                  | 2-3-3<br>(6)                | 3                    |                       | 28                      |                     |                  |                     |                      |
|               |                | gray-brown, gray and reddish brown, stiff below 3.5'     | SPT 2                 | 100                 | 2-4-6<br>(10)               | 3                    |                       | 24                      |                     |                  |                     |                      |
| 5             |                | medium stiff below 6'                                    | SPT 3                 | 100                 | 2-3-4<br>(7)                | 2.5                  |                       | 27                      |                     |                  |                     |                      |
|               |                |  | SPT 4                 | 100                 | 1-3-4<br>(7)                | 3.5                  |                       | 25                      |                     |                  |                     |                      |
| 10            |                | trace of fine sand below 13.5'                           | SPT 5                 | 100                 | 2-2-4<br>(6)                | 2                    |                       | 40                      |                     |                  |                     |                      |
| 15            |                | shaley below 15'   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | tan, highly weathered SHALE                              | SPT 6                 | 100                 | 8-13-16<br>(29)             |                      |                       | 27                      |                     |                  |                     |                      |
| 20            |                |  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Bottom of borehole at 20.0 feet.



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CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/07/20 COMPLETED 05/07/20

GROUND ELEVATION 1005.996 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

| DEPTH<br>(ft)   | GRAPHIC<br>LOG | MATERIAL DESCRIPTION                                     | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|   |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0   |                | TOPSOIL with vegetation                                  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                | (CH) gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 78                  | 1-3-3<br>(6)                | 3.75                 |                       | 27                      |                     |                  |                     |                      |
| 5   |                | gray-brown, gray and reddish brown, stiff below 3.5'     | SPT 2                 | 100                 | 2-3-5<br>(8)                | 3.75                 |                       | 22                      |                     |                  |                     |                      |
|   |                |  | SPT 3                 | 100                 | 3-3-6<br>(9)                | 3.25                 |                       | 23                      |                     |                  |                     |                      |
| 10  |                | medium stiff below 8.5'                                  | SPT 4                 | 100                 | 3-3-4<br>(7)                | 2.75                 |                       | 25                      |                     |                  |                     |                      |
| 15  |                | shaley below 13.5'                                       | SPT 5                 | 100                 | 2-4-5<br>(9)                | 3.75                 |                       | 29                      |                     |                  |                     |                      |
| Refusal at 18.5 feet.<br>Bottom of borehole at 18.5 feet. |                |  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

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# BORING NUMBER B20

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|                     |  |                      |                               |
|---------------------|--|----------------------|-------------------------------|
| CLIENT              | Lee's Summit R-7 School District             | PROJECT NAME         | Lee's Summit Middle School #4 |
| PROJECT NUMBER      | 20-1074                                      | PROJECT LOCATION     | Lee's Summit, Missouri        |
| DATE STARTED        | 05/10/20                                     | COMPLETED            | 05/10/20                      |
| GROUND ELEVATION    | 999.381 ft                                   | HOLE SIZE            | 3.25 inches                   |
| DRILLING CONTRACTOR | CFS Engineers                                | GROUND WATER LEVELS: |                               |
| DRILLING METHOD     | 3.25-inch Continuous Flight                  | AT TIME OF DRILLING  | --- No Free Water Encountered |
| LOGGED BY           | TP   | CHECKED BY           | JE                            |
| AT END OF DRILLING  | --- No Free Water Encountered                |                      |                               |
| NOTES               | AFTER DRILLING --- No Free Water Encountered |                      |                               |

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| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                       |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) dark gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 100                 | 1-3-4<br>(7)                | 3.5                  |                       | 24                      |                     |                  |                     |                      |
| 5             |                |   | SPT 2                 | 89                  | 2-2-4<br>(6)                | 2.75                 |                       | 27                      |                     |                  |                     |                      |
|               |                | gray-brown, gray and reddish brown, stiff below 3.5'          | SPT 3                 | 100                 | 2-4-5<br>(9)                | 3.25                 |                       | 26                      |                     |                  |                     |                      |
| 10            |                |   | SPT 4                 | 100                 | 3-3-5<br>(8)                | 4.5                  |                       | 21                      |                     |                  |                     |                      |

highly weathered LIMESTONE

Refusal at 11.5 feet.  
Bottom of borehole at 11.5 feet.



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CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/07/20 COMPLETED 05/07/20

GROUND ELEVATION 996.623 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

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| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION                                     | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 100                 | 1-2-3<br>(5)                | 2.5                  |                       | 26                      |                     |                  |                     |                      |
| 5             |                | gray-brown, gray and reddish brown, stiff below 3.5'     | SPT 2                 | 89                  | 1-2-4<br>(6)                | 3                    |                       | 29                      |                     |                  |                     |                      |
|               |                |  | SPT 3                 | 100                 | 2-3-5<br>(8)                | 3.75                 |                       | 25                      |                     |                  |                     |                      |
| 10            |                | gray-brown, highly weathered SHALE                       | SPT 4                 | 100                 | 2-4-35<br>(39)              | 3.5                  |                       | 30                      |                     |                  |                     |                      |

Refusal at 12.0 feet.  
Bottom of borehole at 12.0 feet.



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CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/07/20 COMPLETED 05/07/20

GROUND ELEVATION 1001.695 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

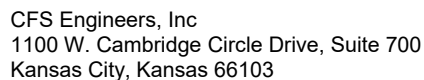
NOTES

AFTER DRILLING --- No Free Water Encountered

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| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                       |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) dark gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 78                  | 1-2-3<br>(5)                | 3.5                  |                       | 30                      |                     |                  |                     |                      |
| 5             |                | gray-brown, gray and reddish brown, stiff below 3.5'          | SPT 2                 | 89                  | 2-4-6<br>(10)               | 3.75                 |                       | 22                      |                     |                  |                     |                      |
|               |                |   | SPT 3                 | 100                 | 2-5-6<br>(11)               | 3.75                 |                       | 23                      |                     |                  |                     |                      |
| 10            |                |   | SPT 4                 | 100                 | 2-3-5<br>(8)                | 3.25                 |                       | 28                      |                     |                  |                     |                      |
|               |                | highly weathered LIMESTONE                                    |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Refusal at 13.0 feet.  
Bottom of borehole at 13.0 feet.



## PAGE 1 OF 1

**PROJECT NAME** Lee's Summit Middle School #4

**PROJECT LOCATION** Lee's Summit, Missouri

**GROUND ELEVATION** 1005.432 ft      **HOLE SIZE** 3.25 inches

**GROUND WATER LEVELS:**

**AT TIME OF DRILLING** --- No Free Water Encountered

**AT END OF DRILLING** --- No Free Water Encountered

**AFTER DRILLING** --- No Free Water Encountered

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Refusal at 14.6 feet.  
Bottom of borehole at 14.6 feet.



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CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/07/20 COMPLETED 05/07/20

GROUND ELEVATION 997.526 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 05/19/20 15:10 - G:\SHARED DRIVES\201074\GEOTECH\EXPLORATION REPORTS\20-1074 LOGS V2.GPJ

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION                                     | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 83                  | 1-3-4<br>(7)                | 2.75                 |                       | 26                      |                     |                  |                     |                      |
|               |                | gray-brown, gray and reddish brown below 3.5'            | SPT 2                 | 100                 | 2-2-4<br>(6)                | 3.25                 |                       | 27                      |                     |                  |                     |                      |
| 5             |                | stiff below 6'   | SPT 3                 | 100                 | 2-3-5<br>(8)                | 2.5                  |                       | 25                      |                     |                  |                     |                      |
|               |                | shaley below 10'   | SPT 4                 | 100                 | 2-3-10<br>(13)              | 4                    |                       | 26                      |                     |                  |                     |                      |
| 10            |                |  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Refusal at 12.0 feet.  
Bottom of borehole at 12.0 feet.



CFS Engineers, Inc  
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Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/11/20 COMPLETED 05/11/20

GROUND ELEVATION 1011.671 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION   | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown, medium stiff LEAN TO FAT CLAY with iron nodules | SPT 1                 | 100                 | 2-3-4<br>(7)                | 3.5                  |                       | 26                      |                     |                  |                     |                      |
|               |                | gray-brown, gray and reddish brown, stiff below 3.5'             | SPT 2                 | 100                 | 2-4-5<br>(9)                | 3.5                  |                       | 27                      | 43                  | 19               | 24                  |                      |
| 5             |                |  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Bottom of borehole at 5.0 feet.





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Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/11/20 COMPLETED 05/11/20

GROUND ELEVATION 1000.457 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- Not Recorded

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- Not Recorded

NOTES

▼ AFTER DRILLING 13.50 ft / Elev 986.96 ft

| DEPTH<br>(ft)   | GRAPHIC<br>LOG | MATERIAL DESCRIPTION  | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---|----------------|---|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|   |                |   |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0   |                | TOPSOIL with vegetation                                       |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                | (CH) dark gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 100                 | 1-3-3<br>(6)                | 2.25                 |                       | 30                      |                     |                  |                     |                      |
|   |                | gray-brown, gray and reddish brown, stiff below 3.5'          | SPT 2                 | 100                 | 2-4-5<br>(9)                | 3.25                 |                       | 27                      |                     |                  |                     |                      |
| 5   |                | medium stiff below 6'   | SPT 3                 | 100                 | 2-2-4<br>(6)                | 2.75                 |                       | 28                      |                     |                  |                     |                      |
|   |                | stiff below 8.5'  | SPT 4                 | 100                 | 2-4-4<br>(8)                | 3.25                 |                       | 29                      |                     |                  |                     |                      |
| 10  |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|   |                | tan, weathered SHALE  | SPT 5                 | 100                 | 50                          |                      |                       | 13                      |                     |                  |                     |                      |
| Refusal at 14.0 feet.<br>Bottom of borehole at 14.0 feet. |                |   |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |





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Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/07/20 COMPLETED 05/07/20

GROUND ELEVATION 993.991 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 05/19/20 15:10 - G:\SHARED DRIVES\201074\GEOTECH\EXPLORATION REPORTS\20-1074 LOGS V2.GPJ

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION   | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) reddish brown, stiff LEAN TO FAT CLAY                             | SPT 1                 | 94                  | 2-3-5<br>(8)                | 2.5                  |                       | 23                      |                     |                  |                     |                      |
|               |                | hard, highly weathered LIMESTONE fragments and CLAY                    | SPT 2                 | 100                 | 14-10-15<br>(25)            |                      |                       | 30                      |                     |                  |                     |                      |
| 5             |                | orangish brown, very stiff, highly weathered SANDSTONE with clay seams | SPT 3                 | 100                 | 6-10-8<br>(18)              |                      |                       | 38                      |                     |                  |                     |                      |
|               |                | tan, very stiff, highly weathered SHALE                                | SPT 4                 | 100                 | 3-10-13<br>(23)             |                      |                       | 21                      |                     |                  |                     |                      |
| 10            |                |  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Refusal at 11.0 feet.  
Bottom of borehole at 11.0 feet.



CFS Engineers, Inc  
1100 W. Cambridge Circle Drive, Suite 700  
Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 05/07/20 COMPLETED 05/07/20

GROUND ELEVATION 988.686 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 05/19/20 15:10 - G:\SHARED DRIVES\201074\GEOTECH\EXPLORATION REPORTS\20-1074 LOGS V2.GPJ

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION                                     | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown, medium stiff FAT CLAY with iron nodules | SPT<br>1              | 83                  | 1-3-4<br>(7)                | 2                    |                       | 31                      | 55                  | 23               | 32                  |                      |
|               |                | gray-brown, gray and reddish brown, stiff below 3.5'     | SPT<br>2              | 83                  | 2-3-5<br>(8)                | 3                    |                       | 30                      |                     |                  |                     |                      |
| 5             |                | highly weathered LIMESTONE                               |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |

Refusal at 7.0 feet.  
Bottom of borehole at 7.0 feet.



CFS Engineers, Inc  
1100 W. Cambridge Circle Drive, Suite 700  
Kansas City, Kansas 66103

CLIENT Lee's Summit R-7 School District

PROJECT NAME Lee's Summit Middle School #4

PROJECT NUMBER 20-1074

PROJECT LOCATION Lee's Summit, Missouri

DATE STARTED 04/30/20 COMPLETED 04/30/20

GROUND ELEVATION 1022.919 ft HOLE SIZE 3.25 inches

DRILLING CONTRACTOR CFS Engineers

GROUND WATER LEVELS:

DRILLING METHOD 3.25-inch Continuous Flight

AT TIME OF DRILLING --- No Free Water Encountered

LOGGED BY TP CHECKED BY JE

AT END OF DRILLING --- No Free Water Encountered

NOTES

AFTER DRILLING --- No Free Water Encountered

GEOTECH BH COLUMNS - GINT STD US LAB.GDT - 05/19/20 15:10 - G:\SHARED DRIVES\201074\GEOTECH\EXPLORATION REPORTS\20-1074 LOGS V2.GPJ

| DEPTH<br>(ft) | GRAPHIC<br>LOG | MATERIAL DESCRIPTION                                     | SAMPLE TYPE<br>NUMBER | RECOVERY %<br>(RQD) | BLOW<br>COUNTS<br>(N VALUE) | POCKET PEN.<br>(tsf) | DRY UNIT WT.<br>(pcf) | MOISTURE<br>CONTENT (%) | ATTERBERG<br>LIMITS |                  |                     | FINES CONTENT<br>(%) |
|---------------|----------------|--|-----------------------|---------------------|-----------------------------|----------------------|-----------------------|-------------------------|---------------------|------------------|---------------------|----------------------|
|               |                |  |                       |                     |                             |                      |                       |                         | LIQUID<br>LIMIT     | PLASTIC<br>LIMIT | PLASTICITY<br>INDEX |                      |
| 0             |                | TOPSOIL with vegetation                                  |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | (CH) gray-brown, medium stiff FAT CLAY with iron nodules | SPT 1                 | 97                  | 1-3-4<br>(7)                | 3.75                 |                       | 24                      | 55                  | 21               | 34                  |                      |
| 5             |                | gray-brown, gray and reddish brown below 3.5'            | SPT 2                 | 100                 | 1-3-4<br>(7)                | 2.5                  |                       | 22                      |                     |                  |                     |                      |
|               |                | stiff below 6'   | SPT 3                 | 100                 | 2-4-5<br>(9)                | 3.5                  |                       | 22                      |                     |                  |                     |                      |
| 10            |                |  | SPT 4                 | 100                 | 3-3-4<br>(7)                | 4                    |                       | 28                      |                     |                  |                     |                      |
|               |                | shaley below 13.5'                                       |                       |                     |                             |                      |                       |                         |                     |                  |                     |                      |
|               |                | orangish-brown, hard, highly weathered SANDSTONE         | SPT 5                 | 100                 | 3-50                        | 3.25                 |                       | 29                      |                     |                  |                     |                      |

Refusal at 14.5 feet.  
Bottom of borehole at 14.5 feet.

## **Appendix C: Portland Cement Stabilization**

## **GUIDELINE FOR CEMENT STABILIZATION**

Cement stabilized soils should not be constructed without the presence of the geotechnical engineer's designated representative.

**MATERIALS.** The material used in stabilization should meet the chemical and physical characteristics of Type I cement ASTM C150. Cement should be kept free from moisture prior to use. Cement stored on the project should be placed in weatherproof bins or buildings with adequate protection from ground dampness.

**CONSTRUCTION.** The cement stabilized soil should be constructed as described herein. The cement should be spread uniformly across the prepared soil surface at the full application rate by using an agricultural seed spreader, mechanical bulk cement spreader, or other equipment acceptable to the geotechnical engineer's designated representative.

Cement stabilized material should be placed in approximately horizontal layers not to exceed 9 inches in uncompacted thickness.

**Subgrade Preparation.** Prior to the beginning of cement treatment, the Contractor should construct the subgrade to an elevation which will provide a subgrade surface conforming to the contract documents upon completion of the cement treatment.

The clay soils should be scarified and pulverized prior to application of the cement. A disc should be used to break up the surface of the material to be stabilized. The mixer or tiller should be used for the full depth of stabilization to break up the clay.

**Application.** Cement should be spread only on those areas where mixing operations can be completed during the same working day. Mixing and spreading should not be performed during freezing temperatures. When the temperature is below 40 degrees F, the completed stabilized fill should be protected against freezing by a sufficient covering of straw, or by other approved methods. Any areas of completed stabilized subgrade course that are damaged by freezing, rainfall, or other weather conditions should be repaired by the contractor.

The cement should be applied with an approved spreader at an application rate that has been established by the geotechnical engineer, based on laboratory tests with the site soils.

The cement should be distributed at a uniform rate and in such a manner to prevent the scattering of cement by wind. Cement should not be added when wind or weather conditions are not favorable in the opinion of the geotechnical engineer's designated representative. A motor grader should not be used to spread the cement.

**Mixing.** The cement, material, and required water should be thoroughly mixed, blended, and pulverized by approved road mixers or by a depth-controlled rotary tiller. Except as provided hereinafter, the Contractor should continue mixing and drying the

## GUIDELINE FOR CEMENT STABILIZATION

soil until all material will pass a 1/2-inch screen. Scarifying and mixing should be controlled to provide uniform depth within 0.1 ft of the depth specified. If, in the opinion of the geotechnical engineer's designated representative the material was mixed to a depth greater than indicated on the drawing or as specified herein, additional cement should be added to achieve the desired application rate. If in the opinion of the geotechnical engineer's designated representative, the material was mixed to a depth less than indicated on the drawing or specified, the material should be remixed.

Moisture content of the mixture should be determined in preparation for final mixing. Moisture in the mixture following final mixing should not be less than the water content determined to be optimum based on dry weight of soil and should not exceed the optimum water content by more than 5 percentage points. Water may be added in increments as large as the equipment will permit; however, such increment of water should be partially incorporated in the mix to avoid concentration of water near the surface. After the last increment of water has been added, mixing should be continued until the water is uniformly distributed throughout the full depth of the mixture, including satisfactory moisture distribution along the edges of the section.

Compaction. The cement stabilized subgrade should be compacted in accordance with the requirements for controlled fill. The compaction should be a minimum of 95% of the maximum density in accordance with ASTM D698 and within +0% to +5% of the optimum moisture content of the cement-stabilized soil.

Not more than 60 minutes should elapse between the time of final mixing and the beginning of compaction.

Protection and Curing. The Contractor should protect the finished treated subgrade from rapid drying, for 7 days, by sprinkling with water as often as is necessary to prevent drying of the surface of the cement-treated subgrade, or by application of the overlying base course. The Contractor should not allow any vehicles or operations which will distort the surface onto the treated surface during the curing period.

# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

BID PACKAGE 00 41 00 – BID FORM

Scope of Work/Bid Package #: \_\_\_\_\_

Company Name: \_\_\_\_\_

Company Street Address: \_\_\_\_\_

Company City, ST & Zip: \_\_\_\_\_

Estimator Name and Phone: \_\_\_\_\_

Authorized Agent Name and Phone: \_\_\_\_\_

## 1.1 **Base Bid**

(Please Submit a Separate Proposal Form for each Bid Package if applicable). The following pricing includes all labor, burden, fringe benefits, materials, tools, equipment, temporary provisions, shipping, fuel, trade permits, markups, fee’s, overhead, insurance and bonds in accordance with the bidding documents.

**BASE BID AMOUNT** \$ \_\_\_\_\_

## 1.2 **Cost Breakdown**

Additional cost breakdown may be requested in final evaluation of proposals only if necessary or required. Refer to scopes of work for any breakdowns.

Breakdown #1: Cost to provide Payment & Performance Bond (not included in base bid

\$ \_\_\_\_\_

Breakdown #2: \_\_\_\_\_ \$ \_\_\_\_\_

Breakdown #3: \_\_\_\_\_ \$ \_\_\_\_\_

Breakdown #4: \_\_\_\_\_ \$ \_\_\_\_\_

Breakdown #5: \_\_\_\_\_ \$ \_\_\_\_\_

Breakdown #6: \_\_\_\_\_ \$ \_\_\_\_\_

Breakdown #7: \_\_\_\_\_ \$ \_\_\_\_\_

## 1.3 **Alternates per Contract Documents**

Indicate if alternate is add or deduct on each item below

Alt #1: \_\_\_\_\_ \$ \_\_\_\_\_

Alt #2: \_\_\_\_\_ \$ \_\_\_\_\_

Alt #3: \_\_\_\_\_ \$ \_\_\_\_\_

Alt #4: \_\_\_\_\_ \$ \_\_\_\_\_

# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

BID PACKAGE 00 41 00 – BID FORM

Alt #5: \_\_\_\_\_ \$ \_\_\_\_\_  
 Alt #6: \_\_\_\_\_ \$ \_\_\_\_\_  
 Alt #7: \_\_\_\_\_ \$ \_\_\_\_\_

## 1.4 **Voluntary Alternates**

Indicate if alternate is add or deduct on each item below

Voluntary Alt #1: \_\_\_\_\_ \$ \_\_\_\_\_  
 Voluntary Alt #2: \_\_\_\_\_ \$ \_\_\_\_\_  
 Voluntary Alt #3: \_\_\_\_\_ \$ \_\_\_\_\_  
 Voluntary Alt #4: \_\_\_\_\_ \$ \_\_\_\_\_  
 Voluntary Alt #5: \_\_\_\_\_ \$ \_\_\_\_\_

## 1.5 **Markups, Labor Rates and Unit Pricing:**

Combined Markup for Overhead & Profit (OH&P) on Change Orders is 10% for work performed by this Contractor’s own forces. If work is performed by a sub-tier, the OH&P is limited to 5% of the sub-tier proposal.

Hourly Labor Rates (To be completed for each trade as it applies to your Scope of Work).

Wage & Benefits – Special Requirements as outlined in the bid documents shall be incorporated.

| TRADE:     |           |            |            |
|------------|-----------|------------|------------|
|            | BASE RATE | OT PREMIUM | DT PREMIUM |
| Apprentice | \$        | \$         | \$         |
| Journeyman | \$        | \$         | \$         |
| Foreman    | \$        | \$         | \$         |

| TRADE:     |           |            |            |
|------------|-----------|------------|------------|
|            | BASE RATE | OT PREMIUM | DT PREMIUM |
| Apprentice | \$        | \$         | \$         |
| Journeyman | \$        | \$         | \$         |
| Foreman    | \$        | \$         | \$         |



# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

## BID PACKAGE 00 41 00 – BID FORM

| TRADE:     |           |            |            |
|------------|-----------|------------|------------|
|            | BASE RATE | OT PREMIUM | DT PREMIUM |
| Apprentice | \$        | \$         | \$         |
| Journeyman | \$        | \$         | \$         |
| Foreman    | \$        | \$         | \$         |

### 1.6 **Unit Pricing**

Reference Individual Bid Packages and specifications for requested unit costs to be submitted. All unit costs shall include all related labor, materials, equipment, supervision, overhead, profit, insurance, bonds, etc., complete.

| NO | DESCRIPTION | UNIT COST | PER UNIT |
|----|-------------|-----------|----------|
|    |             | \$        |          |
|    |             | \$        |          |
|    |             | \$        |          |
|    |             | \$        |          |
|    |             | \$        |          |
|    |             | \$        |          |
|    |             | \$        |          |
|    |             | \$        |          |
|    |             | \$        |          |
|    |             | \$        |          |
|    |             | \$        |          |

### 1.7 **Materials and Specifications:**

All materials are to be bid per specifications, if bidder wishes to utilize an “approved equal”, as allowed by the specification, then bidder shall include cut sheet of proposed material/item with an estimated cost savings for using the submitted product in lieu of the basis of design. This information shall be provided by the bidder at time of bid

Bidders must utilize the Pre-Bid Substitution Request Form provided in the Specifications for any materials not meeting the requirements of the specifications. If approval is not received prior to the bid date then such materials will not be accepted.

# 07-1256 – LEE’S SUMMIT MIDDLE SCHOOL – BUILDING & SITE PACKAGE

## BID PACKAGE 00 41 00 – BID FORM

### 1.8 **Subcontractor Acknowledgement:**

The project IS sales tax exempt.

This Proposal in its entirety is valid for sixty (60) calendar days from the date of this Bid. Adjustments to the price, basis and/or extensions of the date through which the Bid is still valid, may occur only through mutual written consent of the Subcontractor and McCownGordon Construction

By submitting this bid, Subcontractor acknowledges receipt of the construction schedule and the bid reflects the durations included in the schedule.

The bidder hereby acknowledges receipt, review and incorporation of the following as part of this proposal:

|                                     |                              |                             |                            |                            |                            |                            |
|-------------------------------------|------------------------------|-----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Addendum                            | <input type="checkbox"/> 0   | <input type="checkbox"/> 1  | <input type="checkbox"/> 2 | <input type="checkbox"/> 3 | <input type="checkbox"/> 4 | <input type="checkbox"/> 5 |
| Schedule and Logistic Plans         | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                            |                            |                            |                            |
| Bid Package(s)                      | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                            |                            |                            |                            |
| MGC Contract Docs.                  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                            |                            |                            |                            |
| Performance & Payment Bond Included | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                            |                            |                            |                            |
| Prequalification Process Completed  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                            |                            |                            |                            |
| Sales Tax Excluded                  | <input type="checkbox"/> Yes | <input type="checkbox"/> No |                            |                            |                            |                            |

1.9 The undersigned hereby declares that he/she has examined the Construction Documents, Supporting Documents, Owner Contract, has visited the Site, and agrees to all terms and conditions set forth in this bid package and all of the contract documents.

1.10 This proposal in its entirety is valid for thirty (60) calendar days from the date of this Bid. Adjustments to the price, basis and/or extensions of the date through which the Bid is still valid may occur only through mutual written consent of the Bidder and McCownGordon Construction.

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Signature & Date

\_\_\_\_\_  
Phone

\_\_\_\_\_  
Email

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 4A - MASONRY

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Masonry scope in accordance with Division 04 20 00 Unit Masonry & 072100 Thermal Insulation in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Provide all required delegated design shop drawings and calculations signed and sealed by a Professional Engineer licensed in the State of Missouri
    - 1.2.1.2 Provide mockups as required
    - 1.2.1.3 Provide washout pit or dumpsters as required. Include setup, maintenance, removal and all associated hauling and dump fees.
    - 1.2.1.4 Provide dust control during the installation of this scope of work.
    - 1.2.1.5 Provide and remove all temporary engineered shoring and bracing as may be required to complete this scope of work.
    - 1.2.1.6 McCownGordon will provide water source.
    - 1.2.1.7 Provide final cleaning of all work installed under this scope of work
    - 1.2.1.8 Provide protection of all concrete slab-on-grades.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate block-outs required in masonry walls or any penetrations required by other Subcontractors.
    - 1.2.3.2 Coordinate top of wall conditions for fire safing
    - 1.2.3.3 Coordinate the location of the mockup with McCownGordon
    - 1.2.3.1 Coordination and cooperate with masonry consultant. Masonry consultant will be contracted directly with the Owner.
  - 1.2.4 Masonry
    - 1.2.4.1 Furnish and install the following for all buildings:
      - 1.2.4.1.1 All reinforcing as required including all drilling and epoxying any dowels into cast in place concrete
      - 1.2.4.1.2 Mockups
      - 1.2.4.1.3 Monument signs
      - 1.2.4.1.4 Insulation behind masonry veneer
      - 1.2.4.1.5 Accessories for a complete installation, including but not limited to weeps, rebar positioners, cavity netting, cavity drainage material, screenings, wall ties, thru-wall flashing, etc.
      - 1.2.4.1.6 Control and/or expansion joints
      - 1.2.4.1.7 Multiple crews per the construction schedule are included.
      - 1.2.4.1.8 This contractor will provide dumpsters and washout pits for their own material/trash. No masonry will be allowed in McCownGordon provided dumpsters

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

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## 4A - MASONRY

- 1.2.4.1.9 Weather protection: this contractor will be responsible for furnishing, installing and removing all scaffolding, tenting, tarps, etc. McCownGordon will provide heat source and fuel.
- 1.2.4.2 Install the following, furnished by others:
  - 1.2.4.2.1 Embeds and lintels
- 1.2.5 Unit Prices
  - 1.2.5.1 Unit Price #1 - Cost to drill and epoxy 50ea dowels into cast in place concrete  
\$ \_\_\_\_\_/50ea
- 1.2.6 Exclusions
  - 1.2.6.1 Sales Tax
  - 1.2.6.2 Toilets

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 6A - ROUGH CARPENTRY

### Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Rough Carpentry scope in accordance with Division 06 10 00 including [Rough Carpentry, 06 16 00 Sheathing, 06 18 00 Glued-Laminating Construction, 06 40 23 Interior Architectural Woodwork, 06 64 00, Plastic Paneling, 08 11 13 Hollow Metal Doors and Frames, 10 21 13 Toilet Compartments, 10 21 23 Cubicle Curtains and Track, 10 26 00 Wall and Door Protection, 10 28 00 Toilet Bath and Laundry Accessories, 10 44 13 Fire Protection Cabinets, 10 44 16 Fire Extinguishers 10 51 13 Metal Lockers and 10 75 00 Flagpoles, 11 52 13 Projections Screens, 12 32 16 Manufactured Plastic Laminate Casework, 12 32 23 Musical Instrument Storage Cabinets, 12 35 53.16 Plastic-Laminate-Clad Laboratory Casework, 12 3661.16 Solid-Surfacing Countertops and Windowsills and 13 48 00 Sound Control Access Systems] but not limited to the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Subcontractor shall provide a union workforce for all activities claimed by the Carpenters union.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with [Flooring], [Doors, Frames and Hardware], [Overhead Doors], [Signage], [Specialties], [Operable Partitions], [Vehicle and Pedestrian Equipment], [Residential Equipment], [Food Service Equipment], [Educational and Scientific Equipment], Broadcast, Theater and Stage Equipment], [Athletic Equipment], [Healthcare Equipment], [Laboratory Casework], [Aquatics], [Elevators], [Lifts], [Fire Suppression], [Plumbing], [HVAC], [Electrical] Subcontractors for items requiring electrical power or other low voltage wiring and connection.
  - 1.2.4 General
    - 1.2.4.1 Provide all receiving, inventory, spreading out, storage, protection and install of all materials provided under this scope of work or by others and installed under this contract.
    - 1.2.4.2 Provide complete layout field measurement as required for a complete scope of work.
    - 1.2.4.3 This Subcontractor shall provide scaffolding and means of access for worked needing to be performed over all stairs and areas not accessible by lifts. All trades will be allowed to use scaffolding.
    - 1.2.4.4 Furnish and install necessary clips, fasteners, adhesives, hooks, pilasters, structural supports, equipment and miscellaneous items necessary for a complete installation.
    - 1.2.4.5 All spoils to be hauled off site.
    - 1.2.4.6 Provide all dust control measures such as temporary zip walls enclosures and negative air machines to mitigate dust in closed spaces as needed for the duration of the project.
    - 1.2.4.7 Provide all product samples and mock-ups as per the documents.
    - 1.2.4.8 Provide all delegated design necessary for furnished items covered under this scope of work as per the documents.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 6A - ROUGH CARPENTRY

### 1.2.5 Rough Carpentry

- 1.2.5.1 Include all required carpentry materials per Contract Documents, including but not limited to the following:
  - 1.2.5.1.1 Coordinate blocking requirements with other subcontractors as required.
    - 1.2.5.1.1.1 Blocking/backing for all items > [5] lbs. including but not limited to millwork, casework, doors, windows, operable partitions, aluminum-framed entrances and storefronts, fire-rated aluminum frames and storefronts, sliding storefronts Division 10 & 11 items, MEPF components, audio/visual components and kitchen equipment package, etc.
  - 1.2.5.1.2 Roof curbs and blocking
  - 1.2.5.1.3 Interior and exterior plywood sheathing components
  - 1.2.5.1.4 Telephone/IT wall sheathing
  - 1.2.5.1.5 Furnish and Install all cubicle curtain and track as per the drawings.
  - 1.2.5.1.6 Install all interior architectural woodwork as per the drawings.
  - 1.2.5.1.7 Install custom casework and cabinetry items with required coverings and finishes as required for a complete scope of work including but not limited
    - 1.2.5.1.7.1 Manufactured Plastic Laminate Casework,
    - 1.2.5.1.7.2 Musical Instrument Storage Cabinets,
    - 1.2.5.1.7.3 Plastic-Laminate-Clad Laboratory Casework,
    - 1.2.5.1.7.4 Solid-Surfacing Countertops and Windowsills.
  - 1.2.5.1.8 Install all door, frames and hardware provided by others.
  - 1.2.5.1.9 Install all specialty sound control access door, frames and hardware provided by other
  - 1.2.5.1.10 Furnish and install all informational specialty items as per the drawings including but not limited to the following:
    - 1.2.5.1.10.1 MB-01 Markerboard
    - 1.2.5.1.10.2 TB-01 Tackboard
  - 1.2.5.1.11 Install all Solid Surface Countertops called out in the drawings as follows
    - 1.2.5.1.11.1 QZ-01 Quartz Solid Surface Countertops
  - 1.2.5.1.12 Furnish and install all wall and door protection items required for a complete scope of work including but not limited to the following:
    - 1.2.5.1.12.1 CG-01 Corner Guard
    - 1.2.5.1.12.2 GC-01 Corner Guard
  - 1.2.5.1.13 Furnish and install structural glued-laminated timber as per the drawings
    - 1.2.5.1.13.1 Include all adhesives, timber connectors (including but not limited to plates, bars, SS composite truss members, bolts, hinge connectors, tie rods etc..) and accessories needed for a complete scope of work.
    - 1.2.5.1.13.2 Species and grades of wood to be as per the documents for all structural members and architectural appearance.
    - 1.2.5.1.13.3 All fabrication, application of all stains and finishing required for a complete scope of work as per the documents.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 6A - ROUGH CARPENTRY

- 1.2.5.1.14 Furnish and install all toilet compartments as per the drawings.
- 1.2.5.1.15 Furnish and install all toilet bath and laundry accessories as per the drawings.
- 1.2.5.1.16 Furnish and install all fire protection cabinets, brackets and signs as per the drawings.
- 1.2.5.1.17 Furnish and install all fire extinguishers as per the drawings.
- 1.2.5.1.18 Furnish and install all toilet bath and laundry accessories as per the drawings.
- 1.2.5.1.19 Include all proper testing and certification of fire extinguishers prior to substantial completion.
- 1.2.5.1.20 Furnish and install all projections screens as per the documents. Coordinate with the low voltage, electrical and ceilings subcontractors as needed.
- 1.2.5.1.21 Furnish and install all metal lockers as per the drawings.
  - 1.2.5.1.21.1 All labor to be union installers.
- 1.2.5.1.22 Furnish and install all flagpoles as per the drawings.
- 1.2.6 Unit Cost
  - 1.2.6.1.1 Unit Cost #1 to furnish and install blocking
  - 1.2.6.1.2 Unit Cost #2 to furnish and install all cubicle curtain and track
  - 1.2.6.1.3 Unit Cost #3 to install all toilet bath and laundry accessories as
  - 1.2.6.1.4 Unit Cost #4 to install all fire protection specialty items
  - 1.2.6.1.5 Unit Cost #5 to furnish and install all door and wall protection
  - 1.2.6.1.6 Unit Cost #6 to install all architectural woodwork and casework items
  - 1.2.6.1.7 Unit Cost #7 to install additional doors, frames and hardware items
  - 1.2.6.1.8 Unit Cost #8 to install additional doors, frames and hardware items
  - 1.2.6.1.9 Unit Cost #9 to furnish and install additional lockers
  - 1.2.6.1.10 Unit Cost #9 to furnish and install structural laminated timber
  - 1.2.6.1.11
- 1.2.7 Allowances
  - 1.2.7.1 Include \$15,000 in material for infill of windows for weather protection to be used as directed by Contractor's Superintendent
  - 1.2.7.2 Allowances to be tracked and any savings to be returned
- 1.2.8 Exclusions
  - 1.2.8.1 Dumpsters
  - 1.2.8.2 Sales tax
  - 1.2.8.3 Temp Windows
  - 1.2.8.4 Temp Doors
  - 1.2.8.5 Temp Flooring

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 7A – JOINT SEALANTS AND WATERPROOFING

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Joint Sealants and Waterproofing scope in accordance with Specification Sections listed below in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 071326 Self-Adhering Sheet Waterproofing
  - 1.2.2 072100 Thermal Insulation
  - 1.2.3 072500 Weather Barriers
  - 1.2.4 078413 Penetration Firestopping
  - 1.2.5 078446 Fire-Resistive Joint Systems
  - 1.2.6 079200 Joint Sealants
  - 1.2.7 Testing requirements
    - 1.2.7.1 Coordinate all inspections of work as required with Contractor.
    - 1.2.7.2 Perform the following testing as required and provide Contractor with all paperwork: water, smoke, pull, etc. required by the contract documents
  - 1.2.8 Coordination
    - 1.2.8.1 Coordinate all materials with other Subcontractors to ensure compatibility. If not compatible, furnish and install a bridging membrane
    - 1.2.8.2 Coordinate with third party providing testing/inspections:
    - 1.2.8.3 Coordinate with the Glazing Subcontractor for aluminum frames
    - 1.2.8.4 Coordinate with Plumbing Subcontractor
  - 1.2.9 Joint Sealants
    - 1.2.9.1 Include all joint sealants and accessories including but not limited to the following:
      - 1.2.9.1.1 Masonry, Precast and cast stone control joints
      - 1.2.9.1.2 Exterior and interior flatwork
      - 1.2.9.1.3 Exterior and interior hollow metal frames (both sides)
      - 1.2.9.1.4 Exterior and interior of storefront entrances and windows.
      - 1.2.9.1.5 Include all sealants between dissimilar materials
      - 1.2.9.1.6 Include “beauty bead” of window system
      - 1.2.9.1.7 Interior and exterior of building control joints and expansion joints.
  - 1.2.10 Below grade waterproofing
    - 1.2.10.1 Include all below grade waterproofing and accessories including but not limited to the following:
      - 1.2.10.1.1 Complete installation of waterproofing system
      - 1.2.10.1.2 Include all drain tile, filter fabric and aggregate drainage fill complete.
      - 1.2.10.1.3 Make all final piping connections
  - 1.2.11 Fluid-Applied Air Barrier
    - 1.2.11.1 Include all fluid-applied air barrier including but not limited to the following:



# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

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## 7A – JOINT SEALANTS AND WATERPROOFING

- 1.2.11.1.1 Complete installation of air-barrier system
- 1.2.11.1.2 Include air barrier at all locations where indicated, regardless of substrate.
- 1.2.11.1.3 Include tenting as required by weather per the bid schedule. Heating source provided by others
- 1.2.11.2 Fire Stopping
  - 1.2.11.2.1 Include all fire stopping and fire resistive joint systems
  - 1.2.11.2.2 Included is all stenciling or labeling on top of all fire rated walls and partitions.
- 1.2.12 Allowances:
  - 1.2.12.1 Included in base bid is an allowance of 40 man hours and \$5,000 in material to be used as directed by Contractor's Superintendent
  - 1.2.12.2 Allowances to be tracked and any savings to be returned
- 1.2.13 Exclusions
  - 1.2.13.1 Sales Tax
  - 1.2.13.2 Dumpsters
  - 1.2.13.3 Toilets

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 07B – ROOFING & SHEETMETAL

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Roofing scope in accordance with Division 072000 Thermal Insulation, 074231.13 Formed Metal Soffit Panels, 074600 Aluminum Soffit Panels, 075216 Modified Bituminous Membrane Roofing, 076200 Sheet Metal Flashing and Trim, 077200 Roof Accessories in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Provide removal of all debris generated by the scope of work. Include setup, maintenance, removal and all associated hauling and dump fees.
    - 1.2.1.2 Roofing system and manufacturer as required per the contract documents
    - 1.2.1.3 Terminate work to a watertight condition at the end of each workday in order to protect roof insulation and coverboard from weather
    - 1.2.1.4 Provide a 15' warning line throughout the duration of any roofing work. Upon completion of the roofing scope of work, warning line to remain onsite and will be the responsibility of others to maintain and remove
    - 1.2.1.5 **This contractor is responsible for providing their own dumpster for this project. No roofing material/trash is permitted to be thrown into McCownGordon provided dumpsters.**
  - 1.2.2 Testing
    - 1.2.2.1 Provide water testing to meet manufacturer's or Architect's requirements, whichever, is stricter.
    - 1.2.2.2 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with Exterior Fiber Cement wall panel Subcontractor
    - 1.2.3.2 Coordinate with Firestopping Subcontractor
    - 1.2.3.3 Coordinate with Plumbing Subcontractor
    - 1.2.3.4 Coordinate with HVAC Subcontractor
    - 1.2.3.5 Coordinate with Lightning Protection Subcontractor
  - 1.2.4 Roofing
    - 1.2.4.1 Furnish and install all roofing components for modified bitumen roofing at areas A, B, C, D, E, F, G, S, and T including, but not limited to the following:
  - 1.2.1 Sheet Metal Flashings
    - 1.2.1.1 Include all flashing, sheet metal and accessories including but not limited to the following:
      - 1.2.1.1.1 Gutters, scuppers, downspouts, parapet caps, splash blocks, debris screens, etc.
      - 1.2.1.1.2 Include all sealants required for flashing systems.
      - 1.2.1.1.3 End dams
      - 1.2.1.1.4 Break metal
      - 1.2.1.1.5 Closure pieces
      - 1.2.1.1.6 Expansion joints
      - 1.2.1.1.7 Insulation

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

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## 07B – ROOFING & SHEETMETAL

- 1.2.1.1.8 Miscellaneous steel including but not limited to shims, clips, fasteners and accessories
- 1.2.1.1.9 Insulation at rooftop curbs
- 1.2.1.1.10 All sheet metal flashings and sealants integral to the roofing system
- 1.2.1.1.11 Roof expansion joints
- 1.2.1.1.12 Flexible membrane closures
- 1.2.1.1.13 Penetrations including but not limited to curbs, pitch pans, dog houses, roof davits, tiebacks, boots, etc.
- 1.2.1.1.14 Walkway pads
- 1.2.1.1.15 Roof accessories and associated curbs
- 1.2.1.1.16 Special warranties
- 1.2.1.1.17 Cant strips
- 1.2.2 Aluminum Soffit Panels
  - 1.2.2.1 Include all soffit panels including flashing, fasteners and accessories
- 1.2.3 Formed Metal Soffit Panels
  - 1.2.3.1 Include all soffit panels including flashing, fasteners and accessories
- 1.2.4 Exclusions
  - 1.2.4.1 Roof Ladders by others
  - 1.2.4.2 Sales Tax
  - 1.2.4.3 Toilets

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 8A – DOORS, FRAMES AND HARDWARE

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Doors, Frames and Hardware scope in accordance with Division 08 10 00 and 081 1 13 Hollow Metal Frames and Doors including [04 20 00 Unit Masonry, 08 71 00 Door Hardware, 08 80 00 Glazing, 08 85 53 Security Glazing , 09 22 16 Non-Structural Metal Framing, 09 29 00 Gypsum Board, 09 91 23 Interior Painting 13 48 00 Sound Control Access Systems] but not limited to, the following clarifications:
- 1.3 General
  - 1.3.1.1 Verify throat sizes with wall type prior to ordering
  - 1.3.1.2 All frames will need to be shipped and on site prior to framing
  - 1.3.1.3 All frames, doors and hardware to be labeled with mark numbers as indicated on drawings
  - 1.3.1.4 Deliver freight on board (FOB) to jobsite
  - 1.3.1.5 Doors and frames shall come to site prepped for appropriate hardware
  - 1.3.1.6 Provide welded hollow metal frames free of grinder abrasions so that a proper finish can be achieved by the painting Subcontractor
  - 1.3.1.1 Include receiving, unloading, storage of all materials provided as part of this package.
  - 1.3.1.2 Provide separate storage on-site or off-site as needed for all material provided under this scope of work.
- 1.3.2 Testing requirements
  - 1.3.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.3.2.2 All field testing to confirm STC ratings at required openings to be provided and performed complete under this scope of work
- 1.3.3 Coordination
  - 1.3.3.1 Participation is required for a keying meeting as scheduled by Contractor.
  - 1.3.3.2 Coordinate with Electrical and Low Voltage Subcontractors for any hard-wired connections, fire alarm relays required or any security/access control needs
- 1.3.4 Doors, Frames and Hardware:
  - 1.3.4.1 Furnish all construction cores and keys with delivery of the first shipment of permanent doors or sooner if requested from Contractor.
  - 1.3.4.2 Furnish all keying and final cores including final cores at FRP doors / hardware
  - 1.3.4.3 Furnish all hollow metal doors and frames per documents.
  - 1.3.4.4 Furnish all fiber reinforced panel doors and frames per documents.
  - 1.3.4.5 Furnish all sound control access system doors, frames and hardware including but not limited to the following
    - 1.3.4.5.1 All door and frame assemblies complete with acoustical seals, cam lift hinges, fac and all finish hardware factory supplied and installed.
    - 1.3.4.5.2 All doors and frames to be factory prepped for final paint as per the documents
    - 1.3.4.5.3 All door leaf and frame to be factory assembled and installed
    - 1.3.4.5.4 All acoustical performance ratings to be as per the documents. STC ratings at all openings to meet or exceed required specifications.
  - 1.3.4.6 Include all necessary jamb and floor anchors per documents.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 8A – DOORS, FRAMES AND HARDWARE

- 1.3.4.7 Furnish fire rated doors, frames and hardware per documents.
- 1.3.4.8 Furnish all hardware required for a complete scope of work including but not limited to:
  - 1.3.4.8.1 Hinges
  - 1.3.4.8.2 Locks
  - 1.3.4.8.3 Cores
  - 1.3.4.8.4 Surface Closers
  - 1.3.4.8.5 Kick Plates
  - 1.3.4.8.6 Sweeps
  - 1.3.4.8.7 Thresholds
  - 1.3.4.8.8 Rain Drips.
  - 1.3.4.8.9 Overhead stops
  - 1.3.4.8.10 Walls stops
  - 1.3.4.8.11 Door bottoms
  - 1.3.4.8.12 Rain shields
  - 1.3.4.8.13 Removable mullions
  - 1.3.4.8.14 Fire exit hardware
  - 1.3.4.8.15 Rim housings
  - 1.3.4.8.16 . Mortise cylinders
  - 1.3.4.8.17 Gasketing
  - 1.3.4.8.18 Astragal sets
  - 1.3.4.8.19 Latching bolts
  - 1.3.4.8.20 Dust proof strikes
  - 1.3.4.8.21 Coordinators
  - 1.3.4.8.22 Brackets
- 1.3.4.9 Furnish all electrified hardware, accessories and components and as required to provide full access control and security function & capabilities as per the drawings for a complete scope of work
- 1.3.4.10 Include all keying and cylinders as required.
- 1.3.4.11 Include attendance and coordination for keying meeting; meeting to be held on project site.
- 1.3.4.12 Include quick ship premiums to meet project schedule as necessary.
- 1.3.4.13 Deliver all material within this scope of work sorted by area/sequence as directed by McCownGordon Construction.
- 1.3.4.14 Furnish temporary cores as necessary.
- 1.3.4.15 Include any slugging of any dimples frames as necessary.
- 1.3.4.16 Include all anchors necessary to secure doors frames to CMU walls or metal stud wall framing.
- 1.3.4.17 Include clearly marking size, opening, number and hardware set on material.
- 1.3.4.18 Include mortar shields/grout guards for hardware attached to frames set in masonry construction.
- 1.3.4.19 Furnish and install grouting of all frames as required.

# LEE'S SUMMIT MIDDLE SCHOOL #4

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## 8A – DOORS, FRAMES AND HARDWARE

1.3.4.20 All masonry frames required for a complete scope of this work will be furnished and installed per construction schedule in coordination with the construction manager at no additional cost.

### 1.3.5 Exclusions

1.3.5.1 Dumpsters.

1.3.5.2 Sales Tax.

### 1.3.6 Other

1.3.6.1 All fire protection specialties per documents including but not limited to;

1.3.6.2 Fire extinguishers

1.3.6.3 Fire cabinets

1.3.6.4 Mounting brackets and accessories

1.3.6.5 Identification

1.3.6.6 All testing and certification of fire extinguishers prior to substantial completion.

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 08B – OVERHEAD DOORS

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Overhead Doors scope in accordance with Division 083313 Coiling Counter Doors, 083323 Overhead Coiling Doors, 083326 Overhead Coiling Grilles in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 All field/site measuring, or verification is included
    - 1.2.1.2 Include all owner stock and maintenance material
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate electrical and low voltage connections with installing Subcontractor; final connections by Subcontractor
    - 1.2.3.2 Coordinate with countertops and backsplashes with wall mounted tracks
    - 1.2.3.3 Coordinate with mason and drywall subcontractors for openings.
  - 1.2.4 Overhead Doors
    - 1.2.4.1 Furnish and install the following:
      - 1.2.4.1.1 Coiling Counter Doors,
      - 1.2.4.1.2 Overhead Coiling Doors
      - 1.2.4.1.3 Overhead Coiling Grilles
      - 1.2.4.1.4 Included are all fasteners, hardware, etc required for a complete installation.
      - 1.2.4.1.5 Controls system shall be capable of tying into required fire alarm controls system if required
  - 1.2.5 Exclusions
    - 1.2.5.1 Roof Ladders by others
    - 1.2.5.2 Sales Tax
    - 1.2.5.3 Dumpsters
    - 1.2.5.4 Toilets

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 08C – STOREFRONTS & GLASS AND GLAZING

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Entrances, Storefronts and Curtain Wall scope in accordance with Division 084113 Aluminum-Framed Entrances and Storefronts, 084123 Fire-Rated Aluminum Frames Storefronts, 084329 Sliding Mall Fronts, 085113 Aluminum Windows, 085680 Pass Through Windows, 087100 Door Hardware, 088000 Glazing, and 088553 Security Glazing in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Subcontractor shall provide a union workforce for all activities claimed by the Carpenters union.
    - 1.2.1.2 All frames, doors and hardware to be labeled with mark numbers as indicated on drawings
    - 1.2.1.3 Doors and frames shall come to site prepped for appropriate hardware
    - 1.2.1.4 Include receiving, unloading, storage and installation of all materials provided as part of this package
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with Drywall Subcontractor
    - 1.2.3.2 Coordinate with Joint Sealants and Waterproofing Subcontractor
    - 1.2.3.3 Coordinate with Doors, Frames and Hardware Subcontractor for hardware requirements
    - 1.2.3.4 Coordinate with Electrical Subcontractor for any hard-wired connections, fire alarm relays required, or any security/access control needs.
  - 1.2.4 Entrances, storefront, and glazing
    - 1.2.4.1 Furnish and install all aluminum entrances and storefronts
    - 1.2.4.2 Furnish and install all windows and glazing.
    - 1.2.4.3 Furnish and install all finish hardware on all components provided as part of this scope of work.
    - 1.2.4.4 Furnish and install all sliding mall fronts
    - 1.2.4.5 Furnish and install all unframed mirrors. Framed mirrors to be provided by others.
    - 1.2.4.6 Include coordination with the Owner's security wiring Subcontractor
    - 1.2.4.7 Specialty glazing is included per specifications.
  - 1.2.5 Exclusions
    - 1.2.5.1 Sales Tax
    - 1.2.5.2 Dumpsters
    - 1.2.5.3 Caulking perimeter of frames by others
    - 1.2.5.4 Framed Mirrors.



# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9A- FRAMING, DRYWAL, CEILINGS AND WALL COVERINGS

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total interior and exterior Drywall and Ceiling systems, scope in accordance with Division 05 40 00 Cold-Formed Metal Framing, 07 92 19, 07 41 60 Fiber-Reinforced Cementitious Wall Panels, Acoustical Joint Sealants, 07 95 00 Expansion Control, 09 21 16.23 Gypsum Board Shaft Wall Assemblies, 09 22 16 Non-Structural Metal Framing, 09 29 00 Gypsum Board, 09 51 13 Acoustical Ceiling Panels, 09 54 43 Linear Wood Ceilings, 09 84 15 Cementitious Wood Fiber Wall Panels, 09 72 00 Wall Coverings, 09 77 23 Fabric-Wrapped Panels, 09 84 33 Sound-Absorbing Wall Units 13 48 00 Sound Control Access Systems] including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Provide all receiving, inventory, spreading out, storage, protection and install of all materials provided by others but installed under this contract.
    - 1.2.1.2 Provide complete layout as required for work under this scope of work.
    - 1.2.1.3 This Subcontractor shall provide scaffolding and means of access for worked needing to be performed over all stairs and areas not accessible by lifts. All trades will be allowed to use scaffolding.
    - 1.2.1.4 All drywall installations are to be finished taped and sanded ready for the installation of wall finishes. Level of finish to be as indicated in the Construction Documents.
    - 1.2.1.5 This Subcontractor shall include all misc. drywall patching, plaster patching, etc. in all areas that tie into new construction tie-ins, adjacent building walls, soffits, hard lids.
    - 1.2.1.6 Include all drywall repair and patching as needed
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Perform a coordination walk between the painting Subcontractor, McCownGordon Construction and this Subcontractor to confirm the substrate condition before painting begins.
    - 1.2.3.2 This Subcontractor shall participate in MEPFP coordination meetings as required
    - 1.2.3.3 Coordinate with Roofing Subcontractor
    - 1.2.3.4 Coordinate installation of grid with MEPFP trades
    - 1.2.3.5 Coordinate all access panel locations with Architect and Contractor.
    - 1.2.3.6 Coordinate access panel locations with Mechanical, Electrical, Plumbing and Fire Suppression Subcontractor
    - 1.2.3.7 Provide all required delegated design shop drawings and calculations signed and sealed by a Professional Engineer licensed in the State of Missouri.
  - 1.2.4 Drywall
    - 1.2.4.1 Furnish and install all the following but not limited to:
      - 1.2.4.1.1 Secure all hollow metal frames to wall framing system
      - 1.2.4.1.2 Include two (2) full crews working (5) 8-hour days for drywall and finishing for exterior and interior walls.
      - 1.2.4.1.3 All light gauge, structural and miscellaneous metal stud framing for the entire project complete. Framing complete at all soffits, interior and

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9A- FRAMING, DRYWAL, CEILINGS AND WALL COVERINGS

exterior

- 1.2.4.1.4 Include all furring of but not limited to CMU, cast in place, steel, etc...
- 1.2.4.1.5 Gypsum tile backer panels and/or cement board as needed
- 1.2.4.1.6 Wall sheathing
- 1.2.4.1.7 Exterior and interior sheathing, vertical roof curbs, and parapet walls
- 1.2.4.1.8 Gypsum board taping and finishing
- 1.2.4.1.9 Metal trims, reveals and all other components
- 1.2.4.1.10 Sound break assemblies
- 1.2.4.1.11 Shaft wall systems
- 1.2.4.1.12 Joint Cavity infills
- 1.2.4.1.13 Lathing
- 1.2.4.1.14 Include all metal straps per contract documents or as necessary.
- 1.2.4.1.15 Include structural framing, reference structural drawings.
- 1.2.4.2 All insulation including but not limited to
  - 1.2.4.2.1 All thermal batt, including but not limited to all walls, headers, jambs, behind glass, behind metal panels, in metal decking flutes, door frames etc...
  - 1.2.4.2.2 Include all mineral wool, include at fire rated assemblies.
  - 1.2.4.2.3 Include all spray insulation as required
  - 1.2.4.2.4 Include all sound batt insulation and sound attenuation blanket.
- 1.2.4.3 All acoustical sealants at top and bottom of walls per contract documents.
  - 1.2.4.3.1 5.2.1.5.3. Vertical cover board
  - 1.2.4.3.2 5.2.1.5.4. Backerboard for ceramic tile including DenseShield, and AquaTough as required
  - 1.2.4.3.3 Shaft wall/assembly
  - 1.2.4.3.4 Gypsum board specific to bathrooms and all other locations and
  - 1.2.4.3.5 Mold and mildew resistant sheathing as per the documents
  - 1.2.4.3.6 "Green" board
  - 1.2.4.3.7 FRP Panels
- 1.2.4.4 Floor box and cabinet patches, include all mineral wool, zee and angles, gypsum.
- 1.2.4.5 Head of walls at glass walls.
- 1.2.4.6 All access panels specifically indicated in the drawings and specifications
  - 1.2.4.6.1 All ceiling access panels inherent to the mechanical, electrical, plumbing, and fire sprinkler packages and not specifically shown on the contract documents shall be furnished by others and installed by this Subcontractor
- 1.2.5 Acoustical Ceiling Panels
  - 1.2.5.1 Furnish and install the following:
    - 1.2.5.1.1 ACP-01 Standard Acoustical Panel
    - 1.2.5.1.2 Specialty ceilings as per ACP-02 Scrubabale NSF Acoustical Panel
    - 1.2.5.1.3 Linear wood ceilings as per the documents
    - 1.2.5.1.4 Include all suspended acoustical ceilings and grid, hard lid ceiling, gypsum

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9A- FRAMING, DRYWAL, CEILINGS AND WALL COVERINGS

and specialty ceilings.

- 1.2.5.1.5 Include all acoustic panel ceiling support wire as needed.
- 1.2.5.1.6 Include all gyp board fascia
- 1.2.5.1.7 Include all reveal edges
- 1.2.5.1.8 Include all axiom trim.
- 1.2.5.1.9 Include framing & coordination for all light troughs as required
- 1.2.5.1.10 Include all soffits and bulkheads.
- 1.2.5.1.11 Furnish and install all fasteners, insulation, trim, accessories and sealants etc required for a complete installation.
- 1.2.6 Fiber-Reinforced Cementitious Wall Panels
  - 1.2.6.1 Furnish and install all the following
    - 1.2.6.1.1 Fiber-Reinforced Cementitious Wall Panels required for a complete scope of work.
    - 1.2.6.1.2 Furnish and install all fasteners, girts, insulation, weather barrier(s) sheet metal flashing, trim, accessories and sealants needed for a complete installation. Coordinate installation adjacent to masonry
- 1.2.7 Cementitious Wood Fiber Wall Panels,
  - 1.2.7.1 Furnish and install the following
    - 1.2.7.1.1 CP-1: American Fiber Cement Cembrit Solid: S-212 Luna.
    - 1.2.7.1.2 CP-2: American Fiber Cement Cembrit Solid: S-101 Pluto.
    - 1.2.7.1.3 All labor and material needed for a complete installation
    - 1.2.7.1.4 Furnish and install all fasteners, insulation, weather barrier(s), sheet metal flashing, trim, accessories and sealants needed for a complete installation.
    - 1.2.7.1.5 Furnish and install all Z-clips and insulation in wall assembly.
- 1.2.8 Wall Coverings
  - 1.2.8.1.1 All labor and material needed for a complete installation
  - 1.2.8.1.2 Provide all adhesive, fasteners, trim, accessories and sealants needed for a complete installation.
- 1.2.9 Fabric Wrapped Panels
  - 1.2.9.1 Furnish and Install the following
    - 1.2.9.1.1 F-01 Fabric Wall Covering
    - 1.2.9.1.2 All labor and material needed for a complete installation
    - 1.2.9.1.3 Provide all fasteners, trim, accessories and sealants needed for a complete installation.
- 1.2.10 Sound-Absorbing Wall Units
  - 1.2.10.1 Furnish and install the following
    - 1.2.10.1.1 AP-01 Acoustical Panel
    - 1.2.10.1.2 All labor and material needed for a complete installation
    - 1.2.10.1.3 Provide all fasteners, trim, accessories and sealants needed for a complete installation.
- 1.2.11 All gypsum board expansion and control joint assemblies as required per contract documents and industry standards; coordinate locations not indicated with architect and McCownGordon Construction site representative.
- 1.2.12 Include all reveals in drywall for accessories and architectural features.
- 1.2.13 Include all wall moldings per contract documents.

# LEE'S SUMMIT MIDDLE SCHOOL #4

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## 9A- FRAMING, DRYWAL, CEILINGS AND WALL COVERINGS

- 1.2.14 Include complete coordination with hollow metal doors and frames, FRP door, overhead coiling door and sound control access manufacturer.
- 1.2.15 Allowances
  - 1.2.15.1 Allowance #1 = \$5,000 allowance to use weather resistant gypsum boards, metal studs and insulation as needed. This is in addition to what is already required by the contract documents.
  - 1.2.15.2
  - 1.2.15.3 Allowances to be tracked and any savings to be returned
- 1.2.16 Exclusions
  - 1.2.16.1 Dumpsters
  - 1.2.16.2 Sales Tax

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 6B – WOOD FLOORING

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Wood Flooring scope in accordance with Division 09 64 00 and 09 64 00 Wood Stage Flooring, 09 64 10 Factory-Finished Wood Flooring, 09 64 46 Wood Athletic Flooring including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Prefabrication processes need to be reviewed and approved by Contractor prior to fabrication/installation.
    - 1.2.1.2 Removal and haul off all wood flooring spoils as indicated per Contract Documents
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Provide all required delegated design shop drawings and calculations signed and sealed by a Professional Engineer licensed in the State of Missouri.
    - 1.2.3.2 Coordinate staining, painting, and surface graphics with Contractor, Architect and Owner as per the documents.
    - 1.2.3.3 Coordinate perimeter expansion joints with openings
    - 1.2.3.4 Extra materials for Owner's Stock are included as required.
    - 1.2.3.5 All Mockups are included as required.
  - 1.2.4 Wood Flooring
    - 1.2.4.1 Include all wood flooring including, but not limited to the following:
      - 1.2.4.1.1 Wood Stairs/seating
      - 1.2.4.1.2 Vapor barriers
      - 1.2.4.1.3 Moisture mitigation
      - 1.2.4.1.4 Transitions and vented cove base
      - 1.2.4.1.5 Expansion joints
      - 1.2.4.1.6 Include all sanding,
      - 1.2.4.1.7 Include all nosings as required.
      - 1.2.4.1.8 Furnish and install all wood stage flooring, factory-finish wood flooring and wood athletic flooring as required
        - 1.2.4.1.8.1 WD02 – Athletic Wood Flooring as per the documents.
      - 1.2.4.1.9 Wood species is to be as required by the documents
      - 1.2.4.1.10 Finishes are to be as required by the documents
      - 1.2.4.1.11 All substrate verification and environmental testing for floor flatness, concrete moisture content. Provide monitoring of space relative humidity before installation and until scope of work is complete.
      - 1.2.4.1.12 Provide and install a Fid box data logger or similar device that monitors RH of the wood flooring material. Provide a total of (4) devices - (2) devices in each gym space to installed at locations in coordination with the Construction Manager. Devices to be set during installation and stay until scope of work is complete.
      - 1.2.4.1.13 All sub-surface blocking required for bleachers, basketball goals, or point loads exceeding the manufacturers typical install guidelines.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 6B – WOOD FLOORING

- 1.2.4.1.14 Include sand and finish under bleachers separately to allow bleacher installer to complete their work prior to sanding of the balance of the floor.
- 1.2.4.1.15 Install embedded or inlay items provided by others i.e. Volleyball posts, sleeves, markers, electrical box covers, etc.
- 1.2.4.1.16 Include all minor floor/wall preparation, leveling, or infill of spalled concrete as required to complete this scope of work. Include any floor sweeping as required prior to installation
- 1.2.4.1.17 This Subcontractor shall provide any ventilation or exhausting required as related to the installation of this scope.
- 1.2.4.1.18 All wood flooring is to be installed in orientations or patterns as required by the documents
- 1.2.4.1.19 Material is to be delivered to the project an appropriate amount of time prior to installation in order to properly acclimate to the space.
- 1.2.4.1.20 Extra materials for Owner's Stock is included as required.
- 1.2.5 Unit Cost
  - 1.2.5.1 Unit Cost #1 to furnish and install additional square ft. of wood stage flooring
  - 1.2.5.2 Unit Cost #2 to furnish and install additional square ft. of factory finished wood flooring
  - 1.2.5.3 Unit Cost #3 to furnish and install additional square ft. of athletic wood flooring
  - 1.2.5.4
- 1.2.6 Exclusions
  - 1.2.6.1 Sales Tax
  - 1.2.6.2 Dumpsters

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9C – PAINTING

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total interior and exterior Painting and Staining and Transparent Finishing scope in accordance with Division 09 90 00 [09 91 13 Exterior Painting, 09 91 23 Exterior Painting and 09 93 00 Staining and Transparent Finishing 09 96 00 High Performance Coatings], but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Provide surface preparations as needed. Proceeding with the contract work in an area constitutes acceptance of the surfaces to be painted. Notify the Construction Manager, in writing, of any areas or surfaces which are unacceptable. Minor spackling, sanding, caulking and touch-up of drywall/metals and limited to removal of mill scale from steel, etc is assumed to be part of this Contract Work.
    - 1.2.1.2 Verify all surfaces are dry, clean, uniform and free of bond inhibiting substances prior to placement of work. Notify the Construction manager in writing of any defects or conditions adverse to adhesion, protective properties, or appearance. Do not proceed until satisfactory conditions have been resolved.
    - 1.2.1.3 This Subcontractor to provide daily cleanup at all times include sweeping floors completely clean of dryfall material.
    - 1.2.1.4 This Subcontractor shall provide all means of protection against overspray, especially floor surfaces contacting unpainted surfaces. However, should paint be applied to an unscheduled surface, this Subcontractor shall provide clean-up of this over-spray and dry fall material in its entirety.
    - 1.2.1.5 Include protection to adjacent work in place while completing this scope of work.
    - 1.2.1.6 This Subcontractor shall provide adequate ventilation of the work areas to ensure that fumes from the products being utilized by the Subcontractor dissipate quickly to allow other trades to work in the same general area.
    - 1.2.1.7 This Subcontractor shall include preparation, field stain, seal or varnish of any wood components not shown to have a factory finish.
    - 1.2.1.8 Coordinate with applicable contractors to achieve necessary finish for areas to receive finishes in this scope. Notify the Construction Manager of any unacceptable conditions prior to installation of work under this package in writing after prime and 1st coat.
    - 1.2.1.9 Include all extra materials as indicated in the project documents. Items to be labeled and turned over in a neat and orderly fashion.
    - 1.2.1.10 Include all lifts as needed.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
    - 1.2.2.2 Perform all required moisture testing on substrates prior to commencing work as required.
  - 1.2.3 Coordination
    - 1.2.3.1 Verify compatibility with all other building components
    - 1.2.3.2 This Subcontractor shall wait to apply finish coat of paint until directed to do so by Contractor.
    - 1.2.3.3 Coordinate caulking installation with Joint Sealant Subcontractor.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9C – PAINTING

### 1.2.4 Painting

- 1.2.4.1 Furnish and install all the following exterior and exterior painting/coatings including but not limited to:
  - 1.2.4.1.1 Intumescent and high-performance coatings
  - 1.2.4.1.2 Caulking necessary to provide a smooth transition between perpendicular surfaces receiving paint, such as door frames, and borrow lite frames
  - 1.2.4.1.3 Painting of all access panels.
  - 1.2.4.1.4 Painting of all items indicated exterior MEP piping and related equipment as required.
  - 1.2.4.1.5 If spraying the walls to be painted, include provisions to remove excess paint from concrete floors receiving finished flooring. Coordinate with flooring subcontractor.
  - 1.2.4.1.6 Include all sealants at hollow metal frames to sheetrock prior to painting.
  - 1.2.4.1.7 Include sealants at the bottom of frames where frames contact resilient or terrazzo flooring systems.
  - 1.2.4.1.8 Paint all miscellaneous metals including doors (on all 6 sides), frames, handrails, unfinished exposed steel, etc. as defined on the project documents.
  - 1.2.4.1.9 Include all required priming materials and prep work as needed including but not limited to block filler, rust inhibitors, minor sanding, minor prep, etc.
  - 1.2.4.1.10 Final coat of paint to be completed prior to punch list and after interior finish trades have completed work with coordination of MGC and other affected trades.
  - 1.2.4.1.11 Include field touch up of factory finished items receiving stained or clear finish, to be tracked on a T&M basis.
  - 1.2.4.1.12 Clean concrete, masonry walls, or stucco walls to reduce alkalinity or to ensure proper performance of the finish, if required.
  - 1.2.4.1.13 All finishes are to extend behind future locations of fixed equipment such as cabinetry, casework, chalk/tack/marker boards, lockers. Etc.
  - 1.2.4.1.14 All colors, finishes, patterns, thicknesses, etc.... are included as required by the documents.
  - 1.2.4.1.15 Paint all bulkheads, soffits, and drywall ceiling surfaces as required.
  - 1.2.4.1.16 Paint all exposed ceilings as required.
  - 1.2.4.1.17 Paint all exposed concrete walls and ceilings as required by the documents
  - 1.2.4.1.18 Paint all new interior/existing infill walls, existing walls, new walls, etc.... as required
  - 1.2.4.1.19 Paint all interior and exterior hollow metal doors and frames as required
  - 1.2.4.1.20 Paint all steel columns, beams, structure, etc.... exposed to view as required
  - 1.2.4.1.21 Include all concrete block filler & sealer as required
  - 1.2.4.1.22 Include all epoxy painting as required
  - 1.2.4.1.23 Include all epoxy wall coatings as required
  - 1.2.4.1.24 All areas to receive paint including those areas to be covered by casework,



# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9C – PAINTING

marker boards, etc.

1.2.4.1.25 Include painting of wood/plywood at electrical & data type closets/rooms.

1.2.4.1.26 Include painting of all exposed lintels if required by documents

1.2.4.1.27 Include painting of existing and new stair handrails as required by the documents

1.2.4.1.28 Include painting as required at all interior and exterior wall panels per the documents

1.2.4.1.29 Include all staining and transparent finishing.

1.2.4.1.30 Paint all exterior metals, framing and support members noted

### 1.2.5 Allowances

1.2.5.1 Include \$15,000 for additional painting, this is only to be used at McCownGordon Construction's direction and to be tracked against. All savings to be returned to McCownGordon Construction.

### 1.2.6 Unit Cost

#### 1.2.6.1.1

### 1.2.7 Exclusions

1.2.7.1 Dumpsters.

1.2.7.2 Sales Tax.

1.2.7.3 Acoustical wall coverings/panels

1.2.7.4 Vinyl wall coverings

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Tiling scope in accordance with Division 09 30 00 Tiling including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Include all receiving, inventory, spreading out, storage, and installation of all material within this scope of work as coordinated with Contractor. Provide protection of material within this scope of work as necessary.
    - 1.2.1.2 Provide protection to adjacent work in place while completing this scope of work.
    - 1.2.1.3 Flooring transitions shall be made under center of door.
    - 1.2.1.4 Include cleaning and preparation of all surfaces to receive tile prior to the start of installation as required per the bid documents and manufacturer's recommendations.
    - 1.2.1.5 Include removal of protective coatings and clean all final products so they are clean of debris, stains and foreign matter.
    - 1.2.1.6 Include all shimming, filling, leveling, patching, and sloping as required for the different flooring/wall conditions.
    - 1.2.1.7 Verify concrete surfaces to receive tiling meet or exceed the minimum floor flatness/levelness as specified. Report in writing all results to Contractor in writing two weeks prior to starting work. Do not install tile prior to correction of unsatisfactory conditions.
    - 1.2.1.8 All floor preparation required beyond the specified FF/FL concrete specifications is this Subcontractor's responsibility using manufacturer's recommended procedures as needed to ensure a quality finished product.
    - 1.2.1.9 Include all minor floor/wall preparation, leveling, or infill of spalled concrete as required to complete this scope of work. Include any floor sweeping as required prior to installation.
    - 1.2.1.10 Include final adjusting of floor drains.
    - 1.2.1.11 Participate in construction of mock-up
    - 1.2.1.12 Extra materials for Owner's Stock is included as required.
  - 1.2.2 Testing requirements
    - 1.2.2.1 This Subcontractor shall test and confirm that the moisture content, RH %, and PH of the installation locations/surfaces meet all of the Manufacturer's requirements prior to material installation.
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Provide all surveying, layout and field measurements as required to complete this scope of work. Benchmarks will be provided by others.
  - 1.2.4 Floor and wall tile
    - 1.2.4.1 Include all floor and wall tile including but not limited to the following:

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9D - TILING

- 1.2.4.1.1 Furnish and install all floor, wall, and backsplash tile as required
- 1.2.4.1.2 All ceramic, stone, porcelain, and glass tile is included as required
- 1.2.4.1.3 All finishes, sizes, and colors of material are to be as required by the documents.
- 1.2.4.1.4 Furnish and install all transition strips, edge protection, edge trim, transition pieces, corner trim and all other related accessories required for a complete installation.
- 1.2.4.1.5 Furnish and install all grouting as required. Including epoxy grout if required. Grout colors are to be as required.
- 1.2.4.1.6 Furnish and install all mortar as required. Mortar colors are to be as required
- 1.2.4.1.7 Furnish and install joint sealants as required. Joint sealant colors are to be as required.
- 1.2.4.1.8 All floor/grout sealers are included as required.
- 1.2.4.1.9 Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish of built-in items for straight align joints.
- 1.2.4.1.10 All cutting and grinding is to be wet cut, and in a location coordinated and designated with McCownGordon Construction.
- 1.2.4.1.11 This Subcontractor shall provide any ventilation or exhausting required as related to the installation of this scope.
- 1.2.4.1.12 Fit tiles closely to electrical outlets, piping, fixtures, and other penetrations as required.
- 1.2.4.1.13 All tiles are to be installed in orientations or patterns as required by the documents.
- 1.2.4.1.14 All crack isolation membrane for a complete tile installation per contract documents.
- 1.2.4.1.15 All sealants integral with tiling systems
- 1.2.4.1.16 All transition strips for tile to tile and tile to adjacent systems
- 1.2.4.1.17 All waterproofing systems integral to this scope of work
- 1.2.5 Unit Cost
  - 1.2.5.1.1 Unit cost to add or deduct a sq. ft. of tiling
- 1.2.6 Exclusions
  - 1.2.6.1 Dumpsters
  - 1.2.6.2 Sales Tax

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9E – RESILIENT FLOORING AND CARPETING

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Resilient Flooring and Carpeting scope in accordance with Division 09 65 00 [and 09 65 13 Resilient Base and Accessories, 09 65 19 Resilient Tile Flooring 09 65 66 Resilient Athletic Flooring and Tile Carpeting including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 This scope of work to receive confirmation from the Construction Manager prior to releasing purchase of flooring adhesives. It is the responsibility of this scope of work to notify the Construction Manager of when flooring adhesives need to be released in order to meet contract schedule. In the event flooring adhesives are purchased, without confirmation from the Construction Manager, and adhesives need to be changed due to moisture issues this scope of work will not be compensated for purchase of initial adhesives and a full credit will be applied towards the purchase of appropriate adhesives.
    - 1.2.1.2 Provide all minor floor prep and patching as required. Provide all final broom clean with a “clean sweep” floor product prior to installation of materials. Provide sanding of new concrete to sand off any previously applied curing compound, tape/mud finish, or paint residue.
    - 1.2.1.3 Proceeding with the Contract work in an area constitutes acceptance of the surfaces to be covered in flooring. All imperfections in substrate must be brought to the attention of the Construction Manager (in writing) two weeks prior to commencing work. If work is started without notifying the Construction Manager, the Subcontractor is responsible for remedying any defective contract work.
    - 1.2.1.4 Provide and install all mock-ups as needed.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
    - 1.2.2.2 Include verification of all PH levels and moisture content of the installation locations/surfaces meet all of the Manufacturer’s requirements prior to material installation.
  - 1.2.3 Coordination
    - 1.2.3.1 Provide all surveying, layout and field measurements as required to complete this scope of work. Benchmarks will be provided by others.
  - 1.2.4 Resilient Flooring and Carpeting
    - 1.2.4.1 Include all resilient flooring and carpeting including, but not limited to the following:
      - 1.2.4.1.1 Walk off mats
      - 1.2.4.1.2 Expansion joints
      - 1.2.4.1.3 Transitions between all flooring type
    - 1.2.4.2 This Subcontractor has reviewed the documents and has included all work shown and all required supplementary work not shown to provide a complete carpeting, resilient floor tile, and rubber & vinyl base and area rugs scope of work
    - 1.2.4.3 Furnish and install all carpeting as required. Includes all carpet tile, and athletic flooring as required.
    - 1.2.4.4 Furnish and install all area rugs as required

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9E – RESILIENT FLOORING AND CARPETING

- 1.2.4.5 Furnish and install all resilient vinyl flooring, resilient vinyl tile and any luxury vinyl tile, static control vinyl tile as required.
- 1.2.4.6 Furnish and install all rubber and resilient as required.
- 1.2.4.7 Material types, and finish profiles are to be as required by the documents.
- 1.2.4.8 All material finishes, patterns, colors, and sizes are to be per the documents as required.
- 1.2.4.9 All materials are to be installed in patterns, orientations, and directions as required by the documents.
- 1.2.4.10 All adhesives, floor sealers, vapor barriers/membranes as required
- 1.2.4.11 Cleaning of all surfaces to receive material within this scope of work is included as required
- 1.2.4.12 Include all minor floor/wall preparation, leveling, or infill of spalled concrete as required to complete this scope of work. Include any floor sweeping as required prior to installation
- 1.2.4.13 Leveling systems as required for smooth transition between flooring materials is included as required
- 1.2.4.14 Slope to be no greater than 1 to 20
- 1.2.4.15 Furnish and install all trim and transitions strips as required. All trims, and transition strips materials and colors are to be as required by the documents.
- 1.2.4.16 Metal trim and transition strips indicated to be provided by the terrazzo/resinous flooring Trade Partner are to be provided by others.
- 1.2.4.17 Include all transition moldings as required.
- 1.2.4.18 Extra materials for Owner's Stock is included as required.
- 1.2.4.19 All finishes are to be finished at locations to receive fixed equipment such as, cabinetry, casework, chalk and tack marker boards, lockers. Etc....
- 1.2.4.20 5.17. Include all requirements needed to properly ventilate areas during installation.
- 1.2.5 Provide Unit costs as described in specifications as follows
  - 1.2.5.1 Unit Cost #1 Cost to add or deduct square footage of resilient flooring
  - 1.2.5.2 Unit Cost #2 Cost to add or deduct square footage of tile flooring
  - 1.2.5.3 Unit Cost #3 Cost to add or deduct square footage of resilient base and accessories
  - 1.2.5.4 Unit Cost #4 Cost to add or deduct cost of resilient athletic flooring
- 1.2.6 Exclusions
  - 1.2.6.1 Dumpsters.
  - 1.2.6.2 Sales Tax.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 9F – RESINOUS FLOORING

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General
- 1.2 Furnish and install all work required for the complete and total Terrazzo Flooring scope in accordance with Division 09 66 00 [and 09 67 23 – Resinous Flooring] including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Proper ventilation/exhaust of fumes during installation
    - 1.2.1.2 Mock-up with colors, accessories and patterns as per the documents
    - 1.2.1.3 Sloping of floors to drains
    - 1.2.1.4 Saw cutting of control joints and caulking/sealing of control joints
    - 1.2.1.5 All material thickness and heights are to be as indicated on the documents as required.
    - 1.2.1.6 All finishes are to be completely finished at locations to receive fixed equipment such as, cabinetry, casework, chalk and tack marker boards, lockers. Etc....
    - 1.2.1.7 This subcontractor shall be responsible for all lay out as required to complete the installation of this scope of work complete.
    - 1.2.1.8 Furnish and install all divider strips, joint strips, separator strips, transition strips, control joint strips, termination strips, edge termination strips, and misc. trim as required
    - 1.2.1.9 Strip materials/finishes are to be as required by the documents
    - 1.2.1.10 Include metal transition strips where resinous flooring transitions to all other flooring types
    - 1.2.1.11 Subcontractor shall prepare all existing and new concrete slabs per as required in order to receive required floor finishes. Preparation work shall include but is not limited to Pretreatment and sealing of cracks, expansion, contraction, control, and isolation joints.
    - 1.2.1.12 All crack isolation membranes as required are included complete
    - 1.2.1.13 Subcontractor shall furnish and install all primers, adhesives, and sealants as required for installation of all items contained within this scope of work.
    - 1.2.1.14 Minor floor floating, leveling, feather, patching, grinding and infill of spalled concrete as required.
    - 1.2.1.15 A slab/deck conforming to no more than 1/8" variation in 10' shall be considered in tolerance for establishing the anticipated limits of floor preparation
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
    - 1.2.2.2 Include verification of all PH levels and moisture content
  - 1.2.3 Coordination
    - 1.2.3.1 Coordination with Tile Subcontractor to maintain waterproofing system.
    - 1.2.3.2 Coordination with Drywall Subcontractor to ensure a smooth transition where the flooring base meets any new wall construction.
    - 1.2.3.3 Coordination with Flooring Subcontractors for appropriate transition strips where flooring meets a different floor finish or application type.
  - 1.2.4 Resinous Flooring
    - The work of this contract shall include, but shall not be limited to, the following work:

# LEE'S SUMMIT MIDDLE SCHOOL #4

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## 9F – RESINOUS FLOORING

- 1.2.4.1 This Subcontractor has reviewed the documents and has included all work shown and all required supplementary work not shown to provide a complete resinous flooring & base, scope of work.
- 1.2.4.2 Furnish and install all resinous flooring and base as required complete
- 1.2.4.3 Furnish and install all polyurethane seamless flooring as required
- 1.2.4.4 All colors, and final floor finishes are to be per the documents as required
- 1.2.4.5 All resinous base will be integral with the flooring as required per the documents
  - 1.2.4.5.1 Abrasive strips
  - 1.2.4.5.2 Shower basins
- 1.2.5 Unit Cost
  - 1.2.5.1 Unit Cost #1 to add or deduct a square footage of resinous flooring
- 1.2.6 Exclusions
  - 1.2.6.1 Dumpsters
  - 1.2.6.2 Sales Tax

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 10A – EXTERIOR & INTERIOR SIGNAGE

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Information Specialties scope in accordance with Division 10 10 00 [and 10 11 00 Visual Display Units, 10 14 16 Plaques, 10 14 19 Dimensional Letter Signage, 10 14 23 Panel Signage] including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Include all field verifications and preparation as necessary. Notify Contractor of any unsuitable installation locations prior to commencement of work.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate all electrical requirements with the electrical Subcontractor.
    - 1.2.3.2 Coordinate all access panel location with Architect and Contractor.
    - 1.2.3.3 Coordinate all with landscape contractor as needed.
    - 1.2.3.4 Provide all required delegated design shop drawings and calculations signed and sealed by a Professional Engineer licensed in the State of Missouri
  - 1.2.4 Interior Signage
    - 1.2.4.1 Furnish and install all interior signage types and supporting structure as indicated in the contract documents including but not limited:
      - 1.2.4.1.1 Include all interior signage complete per the documents, include all mounting, hardware, stickers, back plates at glass, etc.... as required for a complete scope of work
      - 1.2.4.1.2 Include all door labels as required
      - 1.2.4.1.3 All mockups, samples, and shop drawings are included
      - 1.2.4.1.4 Monuments, raceways, transformers, wiring, and sign lights
      - 1.2.4.1.5 All necessary anchorage, adhesives, support channel, and soffit closure panels.
      - 1.2.4.1.6 All mock-ups and samples as needed.
  - 1.2.5 Exterior Signage
    - 1.2.5.1 Furnish and install all exterior signage types and supporting structure as indicated in the contract documents.
    - 1.2.5.2 Furnish and install all monument signage as per the documents.
      - 1.2.5.2.1 Include all mounting hardware, anchorage, supports, electrical whips and all other components necessary for a complete scope of work.
    - 1.2.5.3 Include complete coordination with electrical subcontractor for electrical requirements and routing of power, electrical subcontractor only to provide power.
    - 1.2.5.4 Include complete design based on contract documents with all fonts, colors, etc required to complete this scope of work.
      - 1.2.5.4.1 Include all permits as necessary to complete this scope of work
      - 1.2.5.4.2 All mock-ups and samples as needed.



# LEE'S SUMMIT MIDDLE SCHOOL #4

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## 10A – EXTERIOR & INTERIOR SIGNAGE

- 1.2.6 Unit Cost
  - 1.2.6.1 Unit Cost to add or deduct vinyl applied door signage
  - 1.2.6.2 Unit Cost to add or deduct ADA door signage
  - 1.2.6.3 Unit Cost to add or deduct sq. ft of monument signage
- 1.2.7 Exclusions
  - 1.2.7.1 Dumpsters
  - 1.2.7.2 Sales Tax

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 10B – FOLDING PANEL PARTITIONS

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Operable Partitions scope in accordance with Division 10 22 00 and 10 22 39 Folding Panel Partitions including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Furnish any embeds necessary for this completion of this scope.
    - 1.2.1.2 Provide drilling or welding of structure to attach supports.
    - 1.2.1.3 Panels shall meet all required STC ratings per the contract documents.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with Steel, Concrete, Masonry and Dry Wall Subcontractor for any attachment details
    - 1.2.3.2 Coordinate with Electrical, Audio Visual, Building Control Management, Lighting Subcontractor for special requirements.
    - 1.2.3.3 Coordinate any blocking requirements with Rough Carpentry Subcontractor
  - 1.2.4 Operable Partitions
    - 1.2.4.1 Furnish and install all the following:
      - 1.2.4.1.1 All hardware, trim, doors, pocket doors, tracks, integral marker boards cranks and accessories
      - 1.2.4.1.2 All miscellaneous structural supports for all suspended or supported systems equipment.
      - 1.2.4.1.3 All steel, track, guide rail as per the drawings
      - 1.2.4.1.4 All manufacturers, partitions model, colors, finishes, options as per documents
  - 1.2.5 Unit Cost
    - 1.2.5.1.1 Unit cost to add or deduct sq. ft of folding panel partitions
  - 1.2.6 Exclusions
    - 1.2.6.1 Sales Tax
    - 1.2.6.2 Dumpsters

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 11A - ATHLETIC EQUIPMENT

### Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Athletic Equipment scope in accordance with Division 116803 Athletic Equipment, 129300 Site Furnishings, 322000 Resilient Track Surfacing, 322100 Running Track Trench Drain System, 328400 Planting Irrigation, 329010 Natural Turf Playing Field, 329113 Soil Preparation in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 Testing requirements
    - 1.2.1.1 Coordinate all inspections of work as required with Contractor
    - 1.2.1.2 Responsible for all agronomic soils tests
    - 1.2.1.3 Conformance survey's per specifications.
  - 1.2.2 Coordination

Coordinate with other trades for rough-in and placement of equipment. Final connections to equipment by others.

- 1.2.3 Athletic Equipment
  - 1.2.3.1 Furnish and install the following:
    - 1.2.3.1.1 Detention Surface Padding with adhesive and accessories per the documents
    - 1.2.3.1.2 Football & Track and Field
      - 1.2.3.1.1.1 Football Goal Posts
      - 1.2.3.1.1.2 Soccer Goals including safety tie-down system 1.2.3.1.1.3  
Discus ring, throw form system, ground sleeve, cage,  
and  
netting at each
      - 1.2.3.1.1.4 Long Jump / Triple Jump take-off boards, sand pits and covers
      - 1.2.3.1.1.5 Shot put ring throw form and toe board system and sector  
edge
      - 1.2.3.1.1.6 Football/Soccer scoreboard system including footings
      - 1.2.3.1.1.7 Football playclocks including footings
      - 1.2.3.1.1.8 Any necessary controllers and relays for equipment to  
function
    - 1.2.3.1.3 Baseball & Softball Fields
      - 1.2.3.1.2.1 Batting Tunnels and netting
      - 1.2.3.1.2.2 Dugout furnishings
      - 1.2.3.1.2.3 Baseball and softball scoreboards including scoreboards per  
contract documents
      - 1.2.3.1.2.4 Baseball Pitching Mound
      - 1.2.3.1.2.5 Baseball Bullpen pitching mounds
      - 1.2.3.1.2.6 Bases, home plates, and pitching rubber
      - 1.2.3.1.2.7 Dugout equipment and accessories per section 2.15 in  
specifications.
      - 1.2.3.1.2.8 Foul Poles including footings
      - 1.2.3.1.2.9 Dugout benches within dugouts only
      - 1.2.3.1.2.10 Waste receptacles & bicycle racks per spec section 129300

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 11A - ATHLETIC EQUIPMENT

- 1.2.4 Track Surfacing
  - 1.2.4.1 Furnish and install the following per the contract documents:
    - 1.2.4.1.1 Soil stabilization and laser grading
    - 1.2.4.1.2 Subbase drainage rock
    - 1.2.4.1.3 Concrete curb as required
    - 1.2.4.1.4 Base course asphalt
    - 1.2.4.1.5 Surface course asphalt
    - 1.2.4.1.6 Rubber track surfacing.
    - 1.2.4.1.7 Track striping
    - 1.2.4.1.8 Included is protection of all adjacent finishes, it is the requirement of this contractor to protect all items that could potentially receive overspray.
- 1.2.5 Running Track Trench Drain System
  - 1.2.5.1 Furnish and install the following per the contract documents:
    - 1.2.5.1.1 All trenching and excavation for drainage piping
    - 1.2.5.1.2 Furnish and install all drainage pipe within track and football field limits. This contractor shall extend drainage piping 5' outside of track limits for Site Utilities contractor to hook onto
    - 1.2.5.1.3 Included are any specialty drains per the specs, ACO drains, etc
- 1.2.6 Planting Irrigation
  - 1.2.6.1 Furnish and install the following per the contract documents:
    - 1.2.6.1.1 This contractor shall furnish & install irrigation piping only within football field and practice football field limits, run piping 5' outside limits and Landscape contractor shall hook up to remaining irrigation and is responsible for remaining scope (backflow, tie in's, etc.)
    - 1.2.6.1.2 This contractor shall furnish & install irrigation piping only within softball and baseball field limits, run piping 5' outside limits and Landscape contractor will hook up to remaining irrigation and will be responsible for remaining scope (backflow, tie in's, etc.)
    - 1.2.6.1.3 This contractor is only responsible for furnishing & installing material within limits, see next page for locations and limits of irrigation install
- 1.2.7 Natural Turf Playing Field
  - 1.2.7.1 Furnish and install the following per the contract documents:
    - 1.2.7.1.1 Football Field
    - 1.2.7.1.2 Practice football field and track & field event areas, see next page for locations and limits of turf install
    - 1.2.7.1.3 Baseball Fields, see next page for locations and limits of turf install
- 1.2.8 Soil Preparation
  - 1.2.8.1 Furnish and install the following per the contract documents:
    - 1.2.8.1.1 All soil prep required by contract documents at Natural Turf Playing Fields only.
- 1.2.9 Unit Cost – Provide unit costs for alternates as described in specifications
  - 1.2.9.1 Unit Cost #1 – Deduct Natural Turf at NW softball field \$ \_\_\_\_\_
  - 1.2.9.2 Unit Cost #2 – Deduct irrigation at NW softball field \$ \_\_\_\_\_

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 11A - ATHLETIC EQUIPMENT

- 1.2.9.3 Unit Cost #3 – Deduct Natural Turf at NE baseball field \$ \_\_\_\_\_
- 1.2.9.4 Unit Cost #4 – Deduct irrigation at NE baseball field \$ \_\_\_\_\_
- 1.2.9.5 Unit Cost #5 – Deduct Natural Turf at SW baseball field \$ \_\_\_\_\_
- 1.2.9.6 Unit Cost #6 – Deduct irrigation at SW baseball field \$ \_\_\_\_\_
- 1.2.9.7 Unit Cost #7 – Cost to deduct Natural Turf at SE Flex field \$ \_\_\_\_\_
- 1.2.9.8 Unit Cost #8 – Deduct irrigation at SE Flex field \$ \_\_\_\_\_
- 1.2.9.9 Unit Cost #9 – Deduct one set of Bases, Home Plates and Pitching Rubber for baseball field \$ \_\_\_\_\_
- 1.2.9.10 Unit Cost #10 – Deduct one set of Bases, Home Plates and Pitching Rubber for softball field \$ \_\_\_\_\_
- 1.2.10 Exclusions
  - 1.2.10.1 Aluminum bleachers and grandstands
  - 1.2.10.2 Sales Tax
  - 1.2.10.3 Dumpsters.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 11B – FOOD SERVICE EQUIPMENT

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Food Service Equipment scope in accordance with Division 11 40 00 Food Service Equipment in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Provide blocking book showing detail locations for all blocking needed for this scope
    - 1.2.1.2 Deliver all components of this installation to the project site and to their final set place. This includes all unloading, storage, staging, assembly and installation.
    - 1.2.1.3 Provide dedicated site supervision of installations to coordinate installation with other trades. Such individual shall be on-site at all times during installation
    - 1.2.1.4 Provide protection of surfaces upon initial installation and removal/discard of protection measures after all trades have completed work
    - 1.2.1.5 This contractor is responsible for reviewing all contract documents to make sure equipment this contractor is providing and MEPFP requirements are coordinated. If specified model numbers are discontinued, new model numbers for equipment need to be reviewed with MEPFP requirements.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with the mechanical, electrical, plumbing and fire protection Subcontractors for rough-in and placement of equipment. Final connections to equipment by others.
    - 1.2.3.2 Coordination with Food Service Equipment Consultant included. Refer to specifications for specific submittals necessary.
    - 1.2.3.3 Deliver all materials, equipment, etc. to project site for install by others according to contract schedule, including but not limited to the following:
      - 1.2.3.3.1 Floor Troughs shall be provided before slab-on-grade pour per contract schedule.
      - 1.2.3.3.2 Roof Curbs shall be provided before Roofing installation per contract schedule
      - 1.2.3.3.3 Exhaust hoods shall be delivered before overhead rough-in per contract schedule.
  - 1.2.4 Food Service Equipment
    - 1.2.4.1 Furnish and install the following:
      - 1.2.4.1.1 Setting of each item into place level, plumb and at correct height/location; tolerances and ADA must be met
      - 1.2.4.1.2 Included is temporary protection of ALL stainless steel countertops and equipment until project completion.
      - 1.2.4.1.3 Field assembly and jointing
      - 1.2.4.1.4 Placement and anchorage of any materials requiring such to floor, walls or ceiling
      - 1.2.4.1.5 Stainless steel wall panels including all field welding.

# LEE'S SUMMIT MIDDLE SCHOOL #4

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## 11B – FOOD SERVICE EQUIPMENT

- 1.2.4.1.6 Closure plates
- 1.2.4.1.7 Sealants, gaskets, back rods as required
- 1.2.4.1.8 Insulation
- 1.2.4.1.9 Labeling and System ID
- 1.2.4.1.10 Cutting, coring, drilling and fastening as required
- 1.2.4.1.11 Walk In Coolers/Freezers including shrouds and angle wall trim
- 1.2.4.1.12 Furnish only, Exhaust Hoods. To be installed by Mechanical Contractor
- 1.2.4.1.13 Light Bulbs, switches, indicators, valves, cover plates, escutcheons
- 1.2.4.1.14 Countertops
- 1.2.4.1.15 Shelving
- 1.2.4.1.16 Roof supports and/or pads shall be complete and fabricated to receive roofing or waterproofing
- 1.2.4.1.17 Condensate drains, pumps and accessories
- 1.2.4.1.18 Field welding of all stainless steel counters, shelves and walls
- 1.2.5 Exclusions
  - 1.2.5.1 Sales Tax
  - 1.2.5.2 Dumpsters
  - 1.2.5.3 Installation of Exhaust Hood

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 11D – STAGE CURTAINS

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Stage Curtains scope in accordance with Division 116143 Stage Curtains in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 Testing requirements
    - 1.2.1.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.2 Coordination
    - 1.2.2.1 Coordinate with other trades for curtain location installation
    - 1.2.2.2 Included are all field measurements
  - 1.2.3 Stage Curtains
    - 1.2.3.1 Furnish and install the following:
      - 1.2.3.1.1 Included are all stage curtain systems, associated rigging, and accessories.
      - 1.2.3.1.2 Included are all brackets, fasteners, etc. necessary for a complete installation
      - 1.2.3.1.3 This Contractor shall include all labeling and identification of systems and system components. In addition, this Contractor shall provide an instructional session to the Owner or Owner's staff as to the operation and function of all systems included herein.
      - 1.2.3.1.4 Provide connections and drilling associated with this scope of work.
      - 1.2.3.1.5 Furnish and install all supplementary structural steel support systems required for this scope of work.
      - 1.2.3.1.6 Provide all layout as required to complete this scope of work.
      - 1.2.3.1.7 Cleaning, adjust and balance as necessary to operate smoothly following installation.
  - 1.2.4 Exclusions
    - 1.2.4.1 Sales Tax
    - 1.2.4.2 Dumpsters
    - 1.2.4.3 Toilets.



# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 11D - GYMNASIUM EQUIPMENT

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Athletic Equipment scope in accordance with Division 116623 Gymnasium Equipment in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 Testing requirements
    - 1.2.1.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.2 Coordination
    - 1.2.2.1 Coordinate with the mechanical, electrical, plumbing and fire protection Subcontractors for rough-in and placement of equipment. Final connections to equipment by others.
  - 1.2.3 Athletic Equipment
    - 1.2.3.1 Furnish and install the following:
      - 1.2.3.1.1 Included is unloading and storage of all materials and equipment
      - 1.2.3.1.2 Basketball goals, equipment, and structure
      - 1.2.3.1.3 Volleyball sleeve assemblies and volleyball nets
      - 1.2.3.1.4 Roll up divider system
      - 1.2.3.1.5 Exercise equipment
      - 1.2.3.1.6 Safety pads
      - 1.2.3.1.7 Gym control center. Coordinate with owner and electrician.
      - 1.2.3.1.8 Scoreboards – Installation to occur before wood flooring is installed. If for some reason it cannot be installed prior to wood flooring, all floor protection is the responsibility of this contractor.
      - 1.2.3.1.9 Hoist motors, assemblies and all controlling devices; power supplied to the area and hookup by others
      - 1.2.3.1.10 Any necessary controllers and relays for the above to function
      - 1.2.3.1.11 Subcontractor shall provide all required fasteners and miscellaneous components as required to provide a complete system.
  - 1.2.4 Exclusions
    - 1.2.4.1 Sales Tax
    - 1.2.4.2 Dumpsters

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 12A - WINDOW COVERINGS

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total interior and exterior Window Coverings scope in accordance with Division 122413 Roller Window Shades including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Include all labor, material, and equipment necessary to complete this scope including any required temporary protection for equipment.
    - 1.2.1.2 Provide interior layout as required under this scope of work, including all field measuring and all other preparation work necessary for all interior spaces to receive window treatments as per the documents. All field measurement as may be required for this scope of work, this may have to be done in more than one trip
    - 1.2.1.3 Include receiving, inventory, storage and installation of material within this scope of work.
    - 1.2.1.4 Include all mock-ups on site prior to installation.
    - 1.2.1.5 Include all owner stock items for each type of window treatment provided under this scope of work as per the documents.
    - 1.2.1.6 Remove any stickers, paper, tape, etc. prior to final acceptance.
    - 1.2.1.7 All material types, finishes and colors are to be by the documents as required.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with rough carpentry and drywall Subcontractor for any attachment details
    - 1.2.3.2 Coordinate all electrical requirements with Electrical Subcontractor.
    - 1.2.3.3 Coordinate all low voltage requirements with Low Subcontractor.
    - 1.2.3.4 Coordinate anchor locations to not void any warranties provided by other trades
    - 1.2.3.5 Coordinate installation location of window treatments with Contractor prior to installation
  - 1.2.4 Window Treatments
    - 1.2.4.1 Furnish and install all window treatments blinds, curtains and drapes, interior shutters, window shades as needed for a complete scope of work.
    - 1.2.4.2 Furnish and install all mechanical dual roller shades with and/or without blackout, manual single roller shades with and/or blackout, AV and/or Light controlled window Shades as per the documents.
    - 1.2.4.3 Include all anchors, clips, trims, fasteners etc. as required for a complete scope of work.
    - 1.2.4.4 Include all controls complete for motorized blinds and shades per documents.
    - 1.2.4.5 Include all fascia's, recessed shade pockets, bottom bars, mounting brackets, rollers and closure panels per documents
    - 1.2.4.6 Include all sealants as necessary to complete this scope of work.
    - 1.2.4.7 Include all owner stock items for each type of window coverings to be provided under this scope of work.

# LEE'S SUMMIT MIDDLE SCHOOL #4

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## 12A - WINDOW COVERINGS

- 1.2.4.8 Protection of adjacent finishes (window sills, etc.) is included
- 1.2.4.9 Included is the cleanup of all debris caused by this contractor from drilling holes, etc.
- 1.2.5 Unit Cost
  - 1.2.5.1 Unit cost to add or deduct additional mechanical roller shades
  - 1.2.5.2 Unit cost to add or deduct additional mechanical window shades
  - 1.2.5.3 Unit cost to add or deduct additional motorized double roller shades
- 1.2.6 Exclusions
  - 1.2.6.1 Sales Tax
  - 1.2.6.2 Dumpsters

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 12B- CASEWORK AND LABORATORY FUMEHOODS

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Laboratory Casework scope in accordance with Division 12 35 53 and [06 40 23 Interior Architectural Woodwork, 06 64 00, Plastic Paneling, 12 32 16 Manufactured Plastic Laminate Casework, 12 32 23 Musical Instrument Storage Cabinets, 12 35 53.16 Plastic-Laminate-Clad Laboratory Casework, 12 36 61.16 Solid-Surfacing Countertops and Windowsills [in accordance with the Contract Documents (plans and specifications)]] including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Include all sealants necessary to complete this scope of work, this includes sealing of backsplashes to wall and includes any sealant at tops.
    - 1.2.1.2 Prepare all lab casework for special applications such as predrilling for installation of hands-free devices, cuts in backsplash and counters for exhaust grilles, tubing from duct penetrations, task/exhaust units, purified water components, and wiring
    - 1.2.1.3 Include all startup and initial commissioning of equipment.
    - 1.2.1.4 Include mockup per documents or Contractor
    - 1.2.1.5 Include all necessary and required signage
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
    - 1.2.2.2 Perform all field testing as required for a complete scope of work including but not limited to ASHRAE 110 performance testing.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with Rough Carpentry and Drywall Subcontractor for any attachment details
    - 1.2.3.2 Coordinate with Fire Suppression Subcontractor
    - 1.2.3.3 Final connection for lab equipment by HVAC, Plumbing or Electrical Subcontractor
    - 1.2.3.4 Verify size of access of equipment prior to ordering and installation with Contractor
  - 1.2.4 Laboratory Casework
    - 1.2.4.1 Furnish the following:
      - 1.2.4.1.1 All interior architectural woodwork as per the drawings.
      - 1.2.4.1.2 All custom casework and cabinetry items with required coverings and finishes per the drawings for a complete scope of work including but not limited
        - 1.2.4.1.2.1 Manufactured Plastic Laminate Casework,
        - 1.2.4.1.2.2 Musical Instrument Storage Cabinets,
        - 1.2.4.1.2.3 Plastic-Laminate-Clad Laboratory Casework,
        - 1.2.4.1.2.4 Solid-Surfacing Countertops and Windowsills.
      - 1.2.4.1.3 Phenolic, epoxy resin tops, P-lam tops, solid surface countertops and window sills, stainless-steel lab counters per documents including but not limited to tops. Include applicable backsplashes. Include all accessories such as grommets and cord slots.
      - 1.2.4.1.4 Task lighting at components as per documents.
      - 1.2.4.1.5 Cutouts in laboratory casework for electrical, gas, fixtures.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 12B- CASEWORK AND LABORATORY FUMEHOODS

- 1.2.4.1.6 Tables and Table assemblies.
- 1.2.4.1.7 Include lab sinks and fixtures including all accessories; Terminations for sinks and faucets by Plumbing Subcontractor.
- 1.2.4.1.8 Provide carts per documents.
- 1.2.4.1.9 Include all shelves, pegboard/drying racks
- 1.2.4.1.10 Laboratory valves at mobile benches, wall valves and water fixtures
- 1.2.4.1.11 Provide finished marine edge where bench tops have been cut back
- 1.2.4.2 Furnish the following:
  - 1.2.4.2.1 Electrical raceway and data wiring, cabling [and task lighting]; installed by others
    - 1.2.4.2.1.1 Include all labeling at raceway
  - 1.2.4.2.2 Plumbing fixtures and piping services to service ceiling panel; installed by others
- 1.2.5 Laboratory Equipment
  - 1.2.5.1 Furnish and install the following:
    - 1.2.5.1.1 All fume hoods as per documents
    - 1.2.5.1.2 Control, monitor and alarm systems as per the specs
- 1.2.6 Exclusions
  - 1.2.6.1 Sales Tax
  - 1.2.6.2 Dumpsters

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 12C – TELESCOPING STANDS AND BLEACHERS

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Multiple Seating scope in accordance with Division 126600 Telescoping Stands, and 126900 Bleachers & Grandstands in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Fasten seating to substrates as required, including connections and drilling.
    - 1.2.1.2 Install seating so moving components operate smoothly and quietly.
    - 1.2.1.3 Breakdown all pallets, crates, and boxes before disposing in provided dumpster.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate requirements with Electrical and Concrete Subcontractor
    - 1.2.3.2 Coordinate with Rough Carpentry and Drywall Subcontractor for any attachment details
  - 1.2.4 Telescoping Stands and Bleachers & Grandstands
    - 1.2.4.1 Furnish and install the following:
      - 1.2.4.1.1 Provide all labor, materials, equipment and management required for the Auditorium Seating, Telescoping Stands, and Aluminum Bleachers and accessories for a complete system as indicated in the contract documents.
      - 1.2.4.1.2 Riser-mounted attachments to maintain uniform chair heights above floor(s).
      - 1.2.4.1.3 Wiring conductors and cables shall be concealed in seating components and accessible for servicing.
      - 1.2.4.1.4 Provide protection for wood flooring, concrete, seats, etc. to avoid damage during install
      - 1.2.4.1.5 Install seating so moving components operate smoothly and quietly.
      - 1.2.4.1.6 Install wiring conductors and cables concealed in components of seating and accessible for servicing.
      - 1.2.4.1.7 Include all required field measurement and coordination with other trades prior to installation.
      - 1.2.4.1.8 All connections and drilling associated with this scope of work is by this Subcontractor.
      - 1.2.4.1.9 Provide all layout as required to complete this scope of work.
      - 1.2.4.1.10 Provide all necessary material handling, hoisting, lifts, ladders, scaffolding and equipment required for this scope of work.
      - 1.2.4.1.11 Include multiple mobilizations in accordance with the phasing and schedule requirements.
  - 1.2.5 Exclusions
    - 1.2.5.1 Sales Tax
    - 1.2.5.2 Dumpsters

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 14A – ELEVATORS

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Elevators scope in accordance with Division 142123.16 in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 All submittals shall be turned into Contractor within 30 days of Notice to Proceed
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
    - 1.2.2.2 Provide testing of operation in generator standby mode if project requires
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with Steel, Concrete, and Metal Framing Subcontractors for any attachment details
    - 1.2.3.2 Coordination of electrical and phone required items
    - 1.2.3.3 Coordinate Fire Fighter's Recall desired level with Fire Department, and/or local Authority Having Jurisdiction, prior to submission to Architect for review and approval. Document in writing for future verification.
  - 1.2.4 Elevators
    - 1.2.4.1 Furnish and install all the following:
      - 1.2.4.1.1 Miscellaneous structural supports for all suspended or supported systems equipment.
      - 1.2.4.1.2 Furnish all embeds to concrete contractor in time for elevator pit wall pours.
      - 1.2.4.1.3 Include maintenance agreement. Include service of all elevators for per terms outlined in contract documents
      - 1.2.4.1.4 Furnish & Install code required elevator signage, including temp signage as needed.
      - 1.2.4.1.5 Pad hooks and pads
      - 1.2.4.1.6 Furnish, install, and remove temp railings as needed
      - 1.2.4.1.7 Furnish and install elevator pit ladder per construction documents
      - 1.2.4.1.8 Included is 2 months of temp elevator use at end of project
  - 1.2.5 Unit Cost
    - 1.2.5.1 Cost to add or delete 1ea month of temp elevator use      \$\_\_\_\_\_/mo
  - 1.2.6 Exclusions
    - 1.2.6.1 Sales Tax
    - 1.2.6.2 Dumpsters
    - 1.2.6.3 Hoist beam furnished and installed by others.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 21A – FIRE SUPPRESSION

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Fire Suppression scope in accordance with Division 21 00 00 and 11 40 00 Food Service Equipment, 210010 – General Fire Suppression, 210500 Common Work Results for Fire Suppression, 210515 Basic Fire Suppression Piping Methods and Materials, 210548 Seismic Controls for Fire Suppression, 210553 Identification for Fire-Suppression Piping and Equipment, 211100 Fire Suppression Water Service Piping, 21200 Fire Suppression Standpipes, 211313 Water Based Fire Suppression Systems in accordance with the Contract Documents (plans and specifications)] including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Provide all system identification required including but not limited to equipment, piping, valves, and control devices.
    - 1.2.1.2 Removal and haul off all fire suppression components and spoils.
    - 1.2.1.3 Provide all extra materials as indicated in the documents.
    - 1.2.1.4 Provide all hoisting and scaffolding as needed for a complete scope of this work.
      - 1.2.1.4.1 All core drilling/cutting and/or furnish and install sleeves for all floor, wall, and roof penetrations not indicated as having a chase. Include all x-ray or ground penetrating radar as necessary
      - 1.2.1.4.2 Furnish all sleeves and/or block outs for installation by the Cast-in Place Concrete contractor, Structural Steel and/or Steel Decking Contractor
      - 1.2.1.4.3 Caulking, sealants, non-shrink grout of all annular space around plumbing piping penetrations required through non-rated wall assemblies. Firestopping of penetrations by others.
    - 1.2.1.5 All vibration and seismic control, vibration and isolation support as required.
    - 1.2.1.6 At conclusion of project, wipe all surfaces of major equipment. Remove excess lubrication and other substances.
  - 1.2.2 Testing requirements
    - 1.2.2.1 All inspections, tests, permits, fees, and certifications required for a final sign-off of all fire suppression systems, control systems, equipment, and material.
      - 1.2.2.1.1 Coordinate all testing and inspections with Contractor and the authorities having jurisdiction
    - 1.2.2.2 Fire Suppression system testing and balancing
    - 1.2.2.3 Water test to verify water pressure and flow rate
    - 1.2.2.4 Flush test of lines
    - 1.2.2.5 Start up, testing and owner training of all systems required including all factory authorized startups.
    - 1.2.2.6 Provide Contractor with all testing verification/paperwork
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with documents and reflected ceiling plans for head types and locations
    - 1.2.3.2 Coordinate layout of Fire Suppression equipment housekeeping pads to installing Subcontractor; pads to be installed by others.



# LEE'S SUMMIT MIDDLE SCHOOL #4

## 21A – FIRE SUPPRESSION

- 1.2.3.3 Coordinate patching of penetrations with drywall, masonry and penetration firestopping subcontractor(s)
- 1.2.3.4 Coordinate all access panel locations required for a complete scope of this work with all trades and provide shop drawings showing locations
- 1.2.3.5 Coordinate with the Site Utilities Subcontractor and drawings at all building tie in locations
- 1.2.3.6 Coordination and cooperate with commissioning agent. Commissioning agent will be contracted directly with the Owner
- 1.2.3.7 Coordinate with and review architectural, code and life safety plans for space types and elevator shafts and furnish and install code-required sprinklers.
- 1.2.3.8 This Project will utilize BIM clash detection. (Management of BIM model by Others)
  - 1.2.3.8.1 Contractor to provide 3D .dwg model file of all system components including but not limited to components 2" diameter and larger, insulation, clearances, access areas, ductwork, fire protection mains and sprinkler heads, light fixture clearances, cable tray, etc. for the purpose of prefabrication and preconstruction coordination.
  - 1.2.3.8.2 Contractor to provide biweekly (twice per week) model updates for coordination purposes and clash detection.
  - 1.2.3.8.3 Contractor must be able to read/import 3D .dwg models from other trades and shall be responsible for reviewing and coordinating with all models.
  - 1.2.3.8.4 Contractor's designer/modeler to attend weekly coordination meetings on site on a yet to be determined weekday and time. In attendance shall be a representative who possess knowledge on this scope of work and has the authority to make decisions for this contractor concerning coordination.
  - 1.2.3.8.5 Clash detection modeling will be utilized for all of the following but not limited to Structural and Misc. Steel, Mechanical, Plumbing, Electrical, Fire Suppression, pneumatic tube systems, underground utilities, etc....
  - 1.2.3.8.6 All models to be built/created. Models from design team will not be available for use. It is assumed that at a minimum, structural and architectural model will be built/created by the respective parties for the fire's suppression contractors use.
- 1.2.3.9 Provide all required delegated design shop drawings and calculations signed and sealed by a Professional Engineer licensed in the State of Missouri
- 1.2.4 Underground work
  - 1.2.4.1 Furnish and install the following:
    - 1.2.4.1.1 exterior fire suppression system excavation and spoil removal [within 5' of the building exterior]
    - 1.2.4.1.2 Final utility connection by others
    - 1.2.4.1.3 All required backfill and required compaction
    - 1.2.4.1.4 All required dewatering
- 1.2.5 Permit Drawings / Shop Drawings

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 21A – FIRE SUPPRESSION

- 1.2.5.1.1 Include all required drawings for permitting for this scope of work including but not limited to Multiple Copies of Drawings per Authority Having Jurisdiction Permitting Requirements.
- 1.2.5.1.2 Drawings will be signed and sealed by an appropriate engineer having jurisdiction and being licensed in the state of Missouri.
- 1.2.5.1.3 The engineer stamping the set of drawings will carry errors and omissions insurance with \$2,000,000 in coverage.
- 1.2.5.1.4 Include procurement of fire sprinkler design approval from city and state (i.e. delivery of plans, responding to comments, etc.) and distribution of approved plans to applicable parties.
- 1.2.5.1.5 Drawings will be submitted to the Authority Having Jurisdiction.
- 1.2.6 Fire Suppression
  - 1.2.6.1 Furnish and install the following:
    - 1.2.6.1.1 Complete fire suppression system
    - 1.2.6.1.2 All systems to meet UL, FM Global and NFPA 13 requirements at a minimum.
    - 1.2.6.1.3 Furnish and Install all Wet & Dry Fire Protection per documents.
    - 1.2.6.1.4 Include all controllers, outlets, valves, pumps, headers, backflows, material, etc. for a complete scope.
    - 1.2.6.1.5 Furnish and install all Non-freeze chemicals required. Excluded as long as not per documents.
    - 1.2.6.1.6 Provide protection of lifts and elevated floors (stairs, etc.) as required by code or documents.
    - 1.2.6.1.7 Provide factory labeling and riser signage of all Fire Protection Piping.
    - 1.2.6.1.8 Provide all field tests and inspections and provide test reports as indicated in the documents. These test reports shall be submitted to Architect and authorities having jurisdiction.
    - 1.2.6.1.9 Provide all field tests and inspections and provide test reports as indicated in the documents. These test reports shall be submitted to Architect and authorities having jurisdiction.
    - 1.2.6.1.10 Provide different types of heads for both wet/dry per architectural: Concealed, semi-recessed, recessed, factory finished colors etc.
    - 1.2.6.1.11 All heads are to be per specifications.
    - 1.2.6.1.12 Furnish and install a complete ansul system fire suppression including all accessories per the documents as required for food service equipment
    - 1.2.6.1.13 Subcontractor shall be responsible for providing all roof, wall, & floor penetrations required including protection of adjacent surfaces and cleanup of debris.
    - 1.2.6.1.14 Furnish and install double check backflow preventers per the documents.
    - 1.2.6.1.15 Furnish and install all standpipes and hose valves per the contract documents.
    - 1.2.6.1.16 Furnish all fire rated and non-fire rated standpipe hose valve boxes, boxes to be provided for installation by others

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 21A – FIRE SUPPRESSION

- 1.2.6.1.17 Furnish and install all pressure maintenance pumps, transfer switches, and all associated components for this project as they apply to the fire sprinkler system.
- 1.2.6.1.18 Furnish and install fire department connection, fire pump, fire pump test header and fire jockey pump controller. Required low voltage and power will be provided and installed by other subcontractor.
- 1.2.6.1.19 Provide owner training as required for all equipment and systems covered under this scope of work.
- 1.2.6.1.20 Furnish all access doors/panels required for and associated with this scope of work, including layout requirements for penetrations. Access panels will be installed by the drywall subcontractor.
- 1.2.6.1.21 Provide all hangers, supports, suspension systems, and framing required for this scope of work unless specifically shown to be provided by structural steel subcontractor. Provide all layout required for the complete installation of the work in this contract.
- 1.2.6.1.22 Furnish and install all galvanized pipe and fittings as required by the contract documents.
- 1.2.6.1.23 Furnish and install all necessary roof hydrants and control valves per the contract documents.
- 1.2.7 Fire Pump and Tank
  - 1.2.7.1 Furnish and install fire pump and tank system. Coordinate and verify fire pump size and flow
- 1.2.8 Exclusions
  - 1.2.8.1 Dumpsters
  - 1.2.8.2 Sales Tax
  - 1.2.8.3 FireStopping Caulk
  - 1.2.8.4 Housekeeping Pads

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 22A – PLUMBING

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Plumbing scope in accordance with Division 22 00 00 [and 22-00 10 General Plumbing Requirements, 22 00 15 Coordination, 22 05 00 Common Work Results, 22 05 13 Common Motor Requirements for Plumbing Equipment, 20 05 15 Basic Piping Materials and Methods, 22 05 19 Meters and Gauges for Plumbing Equipment, 22 05 23 General Duty Valves for Plumbing Piping, 22 05 29 Hangers and Supports for Plumbing Piping, 22 0550 Vibration Isolation for Plumbing Piping and Equipment, 22 05 53 Identification for Plumbing Piping & Equipment, 22 07 70 Plumbing Insulation, 22 11 00 Water Distribution Piping and Specialties, 22 11 11 Mechanically Joined Plumbing Systems, 22 11 23 Domestic Water Pumps, 22 13 00 Sanitary Drainage & Vent Piping Specialties, 22 14 00 Storm Drainage Piping & Specialties, 22 14 89 Sump Pumps, 22 15 00 General Service Compressed Air Systems, 22 33 00 Electric Domestic Water Heaters, 22 34 00 Fuel Fired Domestic Water Heaters, 22 40 00 Plumbing Fixtures, 22 70 00 Natural Gas Systems, 22 70 10 Mechanically Joined Natural Gas Piping Systems, 11 40 00 Food Service Equipment including, but not limited to, the following General
  - 1.2.1.1 Temporary Services
    - 1.2.1.1.1 Provide temporary water as needed.
  - 1.2.1.1 Provide all system identification required in the Contract Documents including but not limited to equipment piping], valves, and control devices
  - 1.2.1.2 Furnish and install access panels as required for this scope of work. Installation of access panels by others.
  - 1.2.1.3 Removal and haul off all plumbing components.
  - 1.2.1.4 Provide all hoisting and scaffolding as needed for a complete scope of this work
  - 1.2.1.5 Provide all material handling, distribution and drayage on site etc of all materials installed under this scope of work onsite
  - 1.2.1.6 All roof, wall and floor fire rated penetrations and sealing of all said penetrations is by others
    - 1.2.1.6.1 All core drilling/cutting and/or furnish and install sleeves for all floor, wall, and roof penetrations not indicated as having a chase. Include all x-ray or ground penetrating radar as necessary.
    - 1.2.1.6.2 Furnish all sleeves and/or block outs as needed for installation by Cast in -Place Concrete Subcontractor, Structural Steel and/or Steel Decking Subcontractor and Kitchen Equipment Contactor.
    - 1.2.1.6.3 Furnish and install all caulking, sealants, non-shrink grout of all annular space around plumbing piping penetrations, required through non-rated wall assemblies. Firestopping of penetrations and openings by others.
  - 1.2.1.7 All vibration control and vibration isolation supports.
  - 1.2.1.8 All structural supports for storm piping as needed.
  - 1.2.1.9 At conclusion of project, wipe all surfaces of major equipment. Remove excess lubrication and other substances.
  - 1.2.1.10 Provide all required expansion joint fittings required for a complete scope of this work.
- 1.2.2 Testing requirements
  - 1.2.2.1 All inspections, tests, fees, and certifications required for a final sign-off of all plumbing systems, control systems, equipment, and material.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 22A – PLUMBING

- 1.2.2.1.1 Coordinate all testing and inspections with Contractor and the authorities having jurisdiction
  - 1.2.2.2 Plumbing system testing and balancing
  - 1.2.2.3 Water test to verify water pressure and flow rate
  - 1.2.2.4 Flush test and sterilization of lines
  - 1.2.2.5 Backflow tests and reports for all installed backflow preventers and RPZ's
  - 1.2.2.6 Start up, testing and owner training of all systems required including all factory authorized startups
  - 1.2.2.7 Provide Contractor with all testing verification/paperwork
- 1.2.3 Coordination
  - 1.2.3.1 Coordinate layout of plumbing equipment housekeeping pads with installing subcontractor; pads to be installed by others.
  - 1.2.3.2 Coordinate patching of penetrations with drywall, cast-in place concrete and Penetration firestopping and all other subcontractor(s) s needed.
  - 1.2.3.3 Coordinate access panel locations with all trades and provide shop drawings showing locations
  - 1.2.3.4 Coordinate all electrical needs with Electrical Subcontractor
  - 1.2.3.5 Coordinate all fire alarm needs with Fire Alarm Subcontractor
  - 1.2.3.6 Coordinate with the Site Utilities Subcontractor and drawings at all building tie in locations
  - 1.2.3.7 Coordinate equipment weight and size with Structural Engineer and structure installing Subcontractor
  - 1.2.3.8 Coordination and cooperate with commissioning authority. Commissioning authority will be contracted directly Lee's Summit Schools
  - 1.2.3.9 This Project will utilize BIM clash detection. (Management of BIM model by Others)
    - 1.2.3.9.1 Contractor to provide 3D .dwg model file of all system components including but not limited to components 2" diameter and larger, insulation, clearances, access areas, ductwork, fire protection mains and sprinkler heads, light fixture clearances, cable tray, etc. for the purpose of prefabrication and preconstruction coordination.
    - 1.2.3.9.2 Contractor to provide biweekly (twice per week) model updates for coordination purposes and clash detection.
    - 1.2.3.9.3 Contractor must be able to read/import 3D .dwg models from other trades and shall be responsible for reviewing and coordinating with all models.
    - 1.2.3.9.4 Contractor's designer/modeler to attend weekly coordination meetings on site on a yet to be determined weekday and time. Also in attendance shall be a representative who possess knowledge on this scope of work and has the authority to make decisions for this contractor concerning coordination.
    - 1.2.3.9.5 Clash detection modeling will be utilized for all of the following but not limited to Structural and Misc. Steel, Mechanical, Plumbing, Electrical, Fire Suppression, pneumatic tube systems, underground utilities, etc....
    - 1.2.3.9.6 All models to be built/created. Models from design team will not be available for use. It is assumed that at a minimum, structural and architectural model will be built/created by the respective parties for plumbing contractors use.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 22A – PLUMBING

- 1.2.4 Drives, Starters and Disconnects
  - 1.2.4.1 Furnish and install the following:
    - 1.2.4.1.1 Factory-mounted or factory-installed (integral with the equipment) starters and disconnects as required for plumbing equipment including all interconnect wiring required for motor starters and disconnects; loose starters, loose disconnects, line voltage wiring and power wiring by others.
    - 1.2.4.1.2 Variable frequency drives with appropriate NEMA enclosure for the location, all supports, and all accessories required for connection to fire alarm and building management systems; line voltage wiring and power wiring by others.
- 1.2.5 Insulation
  - 1.2.5.1 Furnish and install piping and equipment insulation and jacketing required for a complete scope of work.
- 1.2.6 Underground work
  - 1.2.6.1 Furnish and install the following:
    - 1.2.6.1.1 exterior plumbing system excavation and spoil removal [within 5' of the building exterior]
    - 1.2.6.1.2 Final utility connection
    - 1.2.6.1.3 All required backfill and compaction
    - 1.2.6.1.4 All required dewatering
- 1.2.7 Domestic Cold Water
  - 1.2.7.1 Furnish and install the following:
    - 1.2.7.1.1 Backflow preventers and RPZ's located inside and outside of the building
    - 1.2.7.1.2 All make up water to all equipment requiring water
    - 1.2.7.1.3 Domestic water connections to appliances or other equipment; appliances/equipment to be furnished and installed by others
- 1.2.8 Domestic Hot Water
  - 1.2.8.1 Furnish and install the following
    - 1.2.8.1.1 Hot water heater and pumps with all contacts required to communicate with building control system
- 1.2.9 Waste and Vent
  - 1.2.9.1 Furnish and install the following
    - 1.2.9.1.1 Elevator sump pumps and associated piping and accessories with all contacts required to communicate with building control system
    - 1.2.9.1.2 Sanitary connections to appliances; appliances to be provided by others.
- 1.2.10 Food Equipment Service
  - 1.2.10.1 Provide and install walk-in condensate piping. Condensate piping shall be copper plumbing, PVC will not be permitted.
  - 1.2.10.2 Provide and insulate all condensate drain lines in walk-in freezers and coolers using Armaflex.
  - 1.2.10.3 Install all hand sinks not provided and provided by the kitchen equipment contractor.
  - 1.2.10.4 Provide mop hanger and mop sinks.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 22A – PLUMBING

- 1.2.10.5 Provide layout and installation SS floor trough with floor drains as needed. Coordinate with Construction Manager and provide prior to concrete slab pour at needed locations.
- 1.2.10.6 Provide and make final connections to all equipment provided us this scope of work including but not limited to hot water dispensers, coolers, refrigeration systems, disposers, eyewash stations, kleen reel control cabinets, dishwashers, disposal systems, ovens, espresso machines, cold and hot food well units, milk coolers and merchandisers etc.
- 1.2.11 Grease Waste
  - 1.2.11.1 Furnish and install the following:
    - 1.2.11.1.1 Sanitary connections to appliances; appliances to be provided by others
    - 1.2.11.1.2 Grease waste interceptor
    - 1.2.11.1.3 Grease waste piping connections to sanitary system upstream of interceptor
- 1.2.12 Storm
  - 1.2.12.1 Furnish and install storm piping including underground connections to utilities
- 1.2.13 Natural Gas
  - 1.2.13.1 Furnish and install the following:
    - 1.2.13.1.1 Natural gas connections to HVAC equipment and appliances; HVAC equipment and appliances] to be provided by others.
    - 1.2.13.1.2 Gas pressure regulators located inside and outside of the building
- 1.2.14 Compressed Air Systems
  - 1.2.14.1 Furnish and install complete compressed air piping system
- 1.2.15 Filtration
  - 1.2.15.1 Furnish and install all water filtration systems and accessories at all required locations
- 1.2.16 Water Fountain Systems
  - 1.2.16.1 Furnish and install complete all equipment and accessories needed for a complete water fountain system
  - 1.2.16.2 Make final connections to water fountain system
- 1.2.17 Drinking Fountain Systems
  - 1.2.17.1 Furnish and install complete all equipment and accessories needed for a complete drinking fountain system
  - 1.2.17.2 Make final connections to drinking fountain system
- 1.2.18 Beverage Conduit Systems
  - 1.2.18.1 Furnish and install all beverage conduit
- 1.2.19 Fuel Systems
  - 1.2.19.1 Furnish and install lubrication and fluid distribution systems including but not limited to pumps, storage tanks, hose reels with required mounting hardware and flexible tubing for compressed air, water, coolant, oil (multiple weights), hydraulic fluid, transmission fluid, all hangers, supplemental support and accessories.
- 1.2.20 Irrigation
  - 1.2.20.1 Provide and install all sleeves under roads, sidewalks and other locations as needed in coordination with the irrigation contactor for a complete scope of work.

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 22A – PLUMBING

- 1.2.20.2 Provide exterior plumbing system excavation and spoil removal [within 5' of the building exterior]
- 1.2.20.3 Provide final utility connections to the irrigations system as required.
- 1.2.21 Laboratory systems
  - 1.2.21.1 Furnish and install the following:
    - 1.2.21.1.1 Medical vacuum systems
      - 1.2.21.1.1.1 Connections to laboratory equipment and casework fixtures; fixture installation by others
      - 1.2.21.1.1.2 Piping at laboratory casework uprights
    - 1.2.21.1.2 Medical compressed air systems
      - 1.2.21.1.2.1 Connections to laboratory equipment and casework fixtures; fixture installation by others
      - 1.2.21.1.2.2 Piping at laboratory casework uprights
      - 1.2.21.1.2.3 Include emergency compressed air shut off valves; electrical connection by others
    - 1.2.21.1.3 Medical gas systems
      - 1.2.21.1.3.1 Connections to laboratory equipment and casework fixtures; fixture installation by others
      - 1.2.21.1.3.2 Piping at laboratory casework uprights
      - 1.2.21.1.3.3 Include emergency gas shut off valves; electrical connection by others
    - 1.2.21.1.4 Chemical Waste Systems
      - 1.2.21.1.4.1 Chemical waste system including but not limited to receptors, dilution tanks, neutralization tanks, discharge piping, controls, leak detection devices, all required hangers supplemental support and other specialties
    - 1.2.21.1.5 [Distilled] [Reverse Osmosis (RO)] [Deionized (DI)] water systems
      - 1.2.21.1.5.1 Connections to laboratory equipment and casework fixtures; fixture installation by others
      - 1.2.21.1.5.2 Piping at laboratory casework uprights
  - 1.2.22 Exclusions
    - 1.2.22.1 Dumpsters
    - 1.2.22.2 Sales Tax
    - 1.2.22.3 Working Platforms to be provided by others
  - 1.2.23 Other
    - 1.2.23.1 Upon receipt of bid award, please provide the following schedule of values or bid breakouts as follows (as applicable):
      - 1.2.23.1.1 Demolition
      - 1.2.23.1.2 Hoist
      - 1.2.23.1.3 Storm Systems
      - 1.2.23.1.4 Fixtures
      - 1.2.23.1.5 Domestic Water
      - 1.2.23.1.6 Waste & Vent
      - 1.2.23.1.7 Kitchen
      - 1.2.23.1.8 Fuel Systems



# LEE'S SUMMIT MIDDLE SCHOOL #4

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## 22A – PLUMBING

- 1.2.23.1.9 Other
- 1.2.23.1.10 Insulation
- 1.2.23.1.11 Commissioning

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 23A – HEATING, VENTILATION, AND AIR CONDITIONING

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Heating, Ventilation, and Air Conditioning (HVAC) scope in accordance with the entire Division 23 Heating, Ventilating, and Air-Conditioning in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Furnish and install all system identification required in the Contract Documents including but not limited to equipment, ductwork, piping, valves, and control devices.
    - 1.2.1.2 Furnish ceiling access panels as required for this scope of work. Installation of access panels by others.
    - 1.2.1.3 This Contractor shall actively participate in BIM coordination meetings and meet weekly deadlines for updates and changes to shop drawings. Coordination with Electrical, Plumbing, Fire Suppression, Masonry, & Steel Contractors is required.
    - 1.2.1.4 Furnish and install duct and equipment mounted access panels as required for this scope of work.
    - 1.2.1.5 All roof, wall and floor penetrations required to complete this scope of work and sealing of all said penetrations.
      - 1.2.1.5.1 Furnish all sleeves and/or block outs for installation by Precast, Concrete, etc subcontractors
      - 1.2.1.5.2 Caulking, sealants, non-shrink grout of all annular space around HVAC (hydronic and/or refrigerant piping) penetrations, required through non-rated wall assemblies. Firestopping of penetrations by others.
    - 1.2.1.6 All vibration control and vibration isolation supports as required by contract documents.
    - 1.2.1.1 At conclusion of project, wipe all surfaces of major equipment. Remove excess lubrication and other substances.
  - 1.2.2 Testing requirements
    - 1.2.2.1 All inspections, tests, permits, fees, and certifications required for a final sign-off of all HVAC systems, control systems, equipment, and material.
      - 1.2.2.1.1 Coordinate all testing and inspections with Contractor and the authorities having jurisdiction
    - 1.2.2.2 HVAC system testing and balancing
      - 1.2.2.2.1 This Subcontractor shall check, adjust, and balance the components of the HVAC system (air and hydronic systems), which will result in minimum noise, specified temperature, and airflow conditions in the conditioned spaces of the building while the equipment of the system is operating economically.
    - 1.2.2.3 Water test to verify water pressure and flow rate
    - 1.2.2.4 Flush test of lines
    - 1.2.2.5 Coordination of State boiler inspections and all associated fees
    - 1.2.2.6 Start up, testing and owner training of all systems required including all factory authorized startups
    - 1.2.2.7 Provide Contractor with all testing verification/paperwork

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## 23A – HEATING, VENTILATION, AND AIR CONDITIONING

- 1.2.3 Coordination
  - 1.2.3.1 Coordinate layout of HVAC equipment housekeeping pads with installing Subcontractor; pads to be installed by others.
  - 1.2.3.2 Coordinate patching of penetrations with Drywall Subcontractor
  - 1.2.3.3 Coordinate access panel locations with all trades and provide shop drawings showing locations
  - 1.2.3.4 Coordinate all electrical needs with Electrical Subcontractor
  - 1.2.3.5 Coordinate all fire alarm needs with Fire Alarm Subcontractor
  - 1.2.3.6 Coordinate height of roof curbs with roofing system and Roofing Contractor
  - 1.2.3.7 Coordinate equipment weight and size with Structural Engineer and structure installing Subcontractor
  - 1.2.3.8 Coordination and cooperate with commissioning authority. Commissioning authority will be contracted directly with the Owner.
  - 1.2.3.9 Coordinate with and review architectural, code and life safety plans for rated walls and furnish and install code-required fire dampers or fire/smoke dampers
- 1.2.4 Drives, Starters and Disconnects
  - 1.2.4.1 Furnish and install the following:
    - 1.2.4.1.1 Factory-mounted or factory-installed (integral with the equipment) starters and disconnects as required for HVAC equipment including all interconnect wiring required for motor starters and disconnects; loose starters, loose disconnects, line voltage wiring and power wiring by others.
    - 1.2.4.1.2 Variable frequency drives as required for HVAC equipment with appropriate NEMA enclosure for the location, all supports, and all accessories required for connection to fire alarm and building management systems; line voltage wiring and power wiring by others.
- 1.2.5 Insulation
  - 1.2.5.1 Furnish and install piping, ductwork and equipment insulation and jacketing
- 1.2.6 Controls
  - 1.2.6.1 Furnish and install the following:
    - 1.2.6.1.1 Temperature controls and devices, including but not limited to all required air monitoring devices, sensors, low voltage wiring, valves, and connection/communication with other building systems and sensors; fire alarm system connections, backboxes, conduit and power wiring by others.
    - 1.2.6.1.2 Integration, interconnections and instrumentation required to provide a new facility management system
    - 1.2.6.1.3 Specialty rooms such as Kiln rooms, walk-in Freezer & Cooler, etc are included, refer to specifications.
- 1.2.7 HVAC Chilled Water Systems
  - 1.2.7.1 Furnish and install the following:
    - 1.2.7.1.1 Provide chillers and pumps with all contacts required to communicate with building fire alarm and control systems.
    - 1.2.7.1.2 Water treatment

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 23A – HEATING, VENTILATION, AND AIR CONDITIONING

- 1.2.8 HVAC Heating Hot Water Systems
  - 1.2.8.1 Furnish and install the following:
    - 1.2.8.1.1 Provide boilers and pumps with all contacts required to communicate with building fire alarm and control systems.
    - 1.2.8.1.2 Water treatment and chemicals.
- 1.2.9 HVAC Refrigerant Systems
  - 1.2.9.1 Furnish and install refrigerant systems including interior and exterior equipment.
- 1.2.10 HVAC Condensate Systems
  - 1.2.10.1 Furnish and install condensate piping from all HVAC cooling equipment to nearest storm/waste receptacle
  - 1.2.10.2 Heat trace and insulation on exterior condensate. Coordinate power requirements with Electrical Subcontractor
- 1.2.11 Air Distribution
  - 1.2.11.1 Furnish and install all ductwork and distribution systems:
    - 1.2.11.1.1 Ductwork, grilles, registers, diffusers and gravity ventilators to remain covered with plastic until final connections are made
    - 1.2.11.1.2 Protect ductwork, grilles, registers, diffusers and gravity ventilators during shipment and prior to installation. Keep all covered on site and at end of run when installed. Cleaning of duct will be required if covering of ductwork not strictly adhered to.
    - 1.2.11.1.3 Louvers including frame compatible with wall construction
    - 1.2.11.1.4 Furnish and install fans with all contacts required to communicate with building fire alarm and control systems
- 1.2.12 Fans
  - 1.2.12.1 Furnish and install fans with all contacts required to communicate with building fire alarm and control systems.
- 1.2.13 Air Terminal Units
  - 1.2.13.1 Furnish and install air terminal units with all contacts required to communicate with building fire alarm and control systems.
- 1.2.14 Kitchen Exhaust Hoods
  - 1.2.14.1 Hoods will be provided by others. It is the responsibility of the HVAC Contractor to install hood and make all connections necessary for this scope of work. Coordination with Food Service, Fire Suppression, Electrician, and Controls contractors is included.
- 1.2.15 Filtration
  - 1.2.15.1 Furnish and install all filter media at all locations including but not limited to the following:
    - 1.2.15.1.1 Temporary filter media (minimum MERV 8) at all air return inlets during construction once HVAC systems are operational and being used during construction
      - 1.2.15.1.1.1 Include labor to change these filters to permanent filters prior to commissioning & substantial completion
      - 1.2.15.1.1.2 Include labor to change these filters every week
    - 1.2.15.1.2 Initial set of filter media at all equipment during start up
    - 1.2.15.1.3 One final set of filter media installed before test and balance begins.

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## 23A – HEATING, VENTILATION, AND AIR CONDITIONING

- 1.2.16 Flues
  - 1.2.16.1 Furnish and install all flues including but not limited to required mounting hardware, hangers, supplemental steel, gasketing and accessories serving gas-fired water heaters, boilers, kilns or any flue-gas inducing devices.
- 1.2.17 Heaters
  - 1.2.17.1 Furnish and install the following:
    - 1.2.17.1.1 Heaters with all contacts required to communicate with building fire alarm and control systems
    - 1.2.17.1.2 Accessories required to tie to heating system
- 1.2.18 Packaged Equipment
  - 1.2.18.1 Furnish and install the following:
    - 1.2.18.1.1 Packaged HVAC equipment with all contacts required to communicate with building fire alarm and control systems
    - 1.2.18.1.2 Control sequences and points lists
- 1.2.19 Dust Collection Systems
  - 1.2.19.1 Furnish and install dust collection systems including but not limited to dust collection unit, fan, blast gate, flexible tubing, clamps, diverter valves, fume arms, cap, isolation valve, access panel, and mist recyclers, all hangers, supplemental support and accessories, etc. as required by the contract documents.
- 1.2.20 Laboratory systems
  - 1.2.20.1 Furnish and install the following:
    - 1.2.20.1.1 Exhaust and supply connections to laboratory equipment and casework fixtures; fixture installation by others
    - 1.2.20.1.2 Laboratory air control valves, including transformers, valves and assemblies for a complete installation
      - 1.2.20.1.2.1 Laboratory air control valves with all contacts required to communicate with building fire alarm and control systems.
- 1.2.21 Exclusions
  - 1.2.21.1 Sales Tax
  - 1.2.21.2 Dumpsters.
- 1.2.22 Upon receipt of bid award, please provide the following schedule of values or bid breakouts as follows (as applicable):
  - 1.2.22.1 Hoisting
  - 1.2.22.2 Chilled Water Systems
  - 1.2.22.3 Condenser Water Systems
  - 1.2.22.4 Heating Hot Water Systems
  - 1.2.22.5 Air Handling Equipment
  - 1.2.22.6 Sheetmetal Ductwork
  - 1.2.22.7 Sheetmetal Equipment
  - 1.2.22.8 Insulation
  - 1.2.22.9 Other
  - 1.2.22.10 Temperature Controls
  - 1.2.22.11 Test And Balance

# 07-1256 LEE'S SUMMIT MIDDLE SCHOOL #4

## 26A ELECTRICAL, TELECOM, & FIRE ALARM

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Electrical scope in accordance with the entire Division 26, Division 27, & Division 28 specifications in accordance with the Contract Documents (plans and specifications) including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Temporary Services
      - 1.2.1.1.1 Temporary power and lighting for use by all trades in accordance with current OSHA requirements, this includes all buildings
      - 1.2.1.1.2 Temporary power to McCownGordon's Double-wide and single-wide job trailers, location shown on Site Logistics Plan.
      - 1.2.1.1.3 Provide temporary power for temp A/C and Temp Heating units
      - 1.2.1.1.4 Include temporary poles, transformer(s), meter(s), panel(s) and conductors as required
      - 1.2.1.1.5 Provide pigtailed to wood flooring and polish concrete contractors
      - 1.2.1.1.6 Furnish and install a temporary telephone pole and install 2ea construction cameras (provided by McCownGordon). Provide temp power to pole. Demo cameras and telephone pole at end of project and coordinate with McCownGordon. Location shown on Site Logistics Plan
    - 1.2.1.2 Furnish and install all system identification required in the Contract Documents including but not limited to equipment & panels
    - 1.2.1.3 Furnish and install required low voltage cable management systems and accessories
    - 1.2.1.4 Furnish and install access panels as required for this scope of work. Installation of access panels by others.
    - 1.2.1.5 All roof, wall and floor penetrations required to complete this scope of work and sealing of all said penetrations through all non-rated wall assemblies. Firestopping of penetrations by others.
      - 1.2.1.5.1 All core drilling/cutting and/or furnish and install sleeves for all floor, wall, and roof penetrations not indicated as having a chase.
      - 1.2.1.5.2 Furnish all sleeves and/or block outs, boxes, conduit, etc for installation by Precast Subcontractor, Concrete Subcontractor, etc.
      - 1.2.1.5.3 Caulking, sealants, non-shrink grout of all annular space around electrical power, lighting and/or low voltage penetrations, required through non-rated wall assemblies. Firestopping of penetrations by others.
    - 1.2.1.6 All vibration control and vibration isolation supports if required by contract documents
  - 1.2.2 Study requirements
    - 1.2.2.1 All studies as required in the Contract Documents and/or codes
  - 1.2.3 Testing requirements
    - 1.2.3.1 All inspections, tests, permits, fees, and certifications required for a final sign-off of all electrical systems, control systems, equipment, and material.
      - 1.2.3.1.1 Coordinate all testing and inspections with Contractor and the authorities having jurisdiction
      - 1.2.3.1.2 Start up, testing, system certifications and owner training of all electrical

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## 26A ELECTRICAL, TELECOM, & FIRE ALARM

- systems required including all factory authorized startups
- 1.2.3.1.3 Meggar testing on all new and existing feeders
- 1.2.3.1.4 Provide Contractor with all testing verification/paperwork.
- 1.2.4 Coordination
  - 1.2.4.1 Coordinate layout of electrical equipment housekeeping pads with installing Subcontractor; pads to be installed by others.
  - 1.2.4.2 Coordinate layout of exterior light pole bases with installing Subcontractor; light pole bases to be installed by others
  - 1.2.4.3 Coordinate layout of encasement/vault area
  - 1.2.4.4 Coordinate layout of exterior transformer pad with Utility Company and installed Subcontractor; pads to be installed by others.
  - 1.2.4.5 Coordinate with the Site Utilities Subcontractor and drawings at all building tie in locations
  - 1.2.4.6 Coordinate power requirements with Food Service contractor for each piece of equipment provided.
  - 1.2.4.7 Coordinate with all Subcontractors for items requiring electrical power or other low voltage wiring and connection.
  - 1.2.4.8 Coordinate equipment weight and size with Structural Engineer and structure installing Subcontractor
- 1.2.5 Controls
  - 1.2.5.1 Furnish and install al lighting controls and devices
- 1.2.6 Underground work
  - 1.2.6.1 Furnish and install the following:
    - 1.2.6.1.1 exterior electrical system excavation and spoil removal
    - 1.2.6.1.2 All required backfill and compaction
    - 1.2.6.1.3 All required dewatering
- 1.2.7 New utility work
  - 1.2.7.1 Furnish and install the following:
    - 1.2.7.1.1 Primary electrical service conduits
      - 1.2.7.1.1.1 Provide electrical service installed per the City of Lee's Summit and Evergy standards.
    - 1.2.7.1.2 Secondary electrical service conduits and conductors; primary conductors shall be furnished and installed by the utility company
    - 1.2.7.1.3 All spoils created by this contractor shall be hauled off site.
- 1.2.8 Power
  - 1.2.8.1 Furnish and install the following:
    - 1.2.8.1.1 "Loose" starters and disconnects (not integral with equipment) for all equipment
    - 1.2.8.1.2 Final connection including interconnection(s), line voltage/power wiring, conduit and fire alarm connection required; factory-mounted or factory-installed starters, disconnects, and variable speed drives furnished by others.
    - 1.2.8.1.3 Emergency Power Off (EPO) push buttons. Coordinate location and sizing with Architect and controlled equipment.
  - 1.2.8.2 Equipment by Others

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## 26A ELECTRICAL, TELECOM, & FIRE ALARM

- 1.2.8.2.1 Provide all final connections (wiring, conduit, raceway, connectors, etc.) to all powered equipment provided by others as required. Coordinate power requirements with furnishing party (Owner, Supplier, Subcontractor, Contractor) prior to install.
- 1.2.9 Lightning Protection
  - 1.2.9.1 Furnish and install lightning protection system including but not limited to conductors, terminals, ground rods, ground plates, bonding plates, through roof connectors, down conductor guards, anchors and fasteners, connectors, exothermic welds, and all other accessories
- 1.2.10 Lighting
  - 1.2.10.1 Furnish and install light fixtures including but not limited to interior lighting, exterior building mounted lighting, landscape lighting, parking lot lighting and poles, athletic field lighting, etc.
- 1.2.11 Fire Alarm System
  - 1.2.11.1 Furnish and install the following:
    - 1.2.11.1.1 Fire alarm system record of completion
    - 1.2.11.1.2 Furnish duct smoke detectors to the HVAC Subcontractor for installation into the duct work. Once installed in ductwork, install final connections to the fire alarm system
    - 1.2.11.1.3 Conduit for fire alarm wiring as required per Contract Documents
    - 1.2.11.1.4 Wiring and final connection to fire/smoke dampers to the fire alarm system
- 1.2.12 Telecom Systems
  - 1.2.12.1 Furnish and install complete system capable for voice/data including all cabling, conduit, j-hooks, cable tray, backboxes, faceplates, panels and equipment. Ensure proper voice, data and communication requirements are met, and final connections are completed
    - 1.2.12.1.1 Furnish and install all cabling for owner provided wireless access points. Install wireless access points.
    - 1.2.12.1.2 Furnish and install all required IT infrastructure, including but not limited to data racks, grounding systems, and ladder racks
  - 1.2.12.2 Furnish and install "rough-in" (conduit and backboxes) per contract documents for all data, IT and networking systems
- 1.2.13 Audio-Visual Systems
  - 1.2.13.1 Furnish and install "rough-in" (conduit and backboxes) and cabling per contract documents for all audio-visual systems including but not limited to monitors, wall displays, projectors, and speakers.
    - 1.2.13.1.1 Install all owner furnished monitor wall and/or ceiling brackets.
    - 1.2.13.1.2 Furnish and install all built-in projection screens. Surface mount projection screens will be provided by owner.
- 1.2.14 Communications Systems
  - 1.2.14.1 Furnish and install complete system capable for voice systems including all cabling, conduit, backboxes, faceplates, panels and equipment. Ensure proper Public Address and Sound system requirements are met, and final connections and programming are completed.
- 1.2.15 Security Systems



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## 26A ELECTRICAL, TELECOM, & FIRE ALARM

- 1.2.15.1 Furnish and install "rough-in" (conduit and backboxes) and cabling per contract documents for Security Camera system. Security Camera components (cameras, NVR, programming, etc.) provided by Owner.
- 1.2.15.2 Furnish and install complete Door Access Control system including all cabling, conduit, backboxes, faceplates, panels and equipment. Provide all necessary programming, testing, and final connections. Coordinate all system requirements with door hardware provider.
- 1.2.16 Distributed Systems
  - 1.2.16.1 Furnish and install complete system capable for Clock systems including all cabling, conduit, backboxes, faceplates, panels, brackets and equipment. Ensure all Clock system final connections and programming are completed.
- 1.2.17 Allowances
  - 1.2.17.1 Include an allowance of \$15,000 for temporary site lighting.
  - 1.2.17.2 Allowances to be tracked and any savings to be returned
- 1.2.18 Exclusions
  - 1.2.18.1 Sales Tax
  - 1.2.18.2 Dumpsters
- 1.2.19 Upon receipt of bid award, please provide the following schedule of values or bid breakouts as follows (as applicable):
  - 1.2.19.1.1 Temporary Power/Lighting
  - 1.2.19.1.2 Utility | Elec Service
    - 1.2.19.1.2.1 Normal Distribution
    - 1.2.19.1.2.2 Emergency Distribution
  - 1.2.19.1.3 Site Lighting
  - 1.2.19.1.4 Interior Lighting
    - 1.2.19.1.4.1 Lighting
    - 1.2.19.1.4.2 Lighting Controls
  - 1.2.19.1.5 Power
  - 1.2.19.1.6 Fire Alarm
  - 1.2.19.1.7 Low Voltage Systems
    - 1.2.19.1.7.1 IT
    - 1.2.19.1.7.2 Audio Visual Systems
    - 1.2.19.1.7.3 Security Systems
    - 1.2.19.1.7.4 Telephone
    - 1.2.19.1.7.5 CCTV
    - 1.2.19.1.7.6 Intercom
    - 1.2.19.1.7.7 Clock
    - 1.2.19.1.7.8 Specialty Systems
  - 1.2.19.1.8 Lightning Protection
  - 1.2.19.1.9 Commissioning/Testing
  - 1.2.19.1.10 Sports Lighting

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 32A - LANDSCAPING

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General
- 1.2 Furnish and install all work required for the complete and total Landscape scope in accordance with Division 32 80 00 and 32 84 00 Planting Irrigation, 32 91 13 – Soil Preparation, 32 92 00 - Turf and Grasses, 32 93 00 Plants including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Provide all fine grading and handwork
    - 1.2.1.2 Site shall be brought to +/- 1/10 foot by Earthwork Subcontractor. Adjustments to grading beyond that shall be included within this package including any import/haul off of material. Amend topsoil as needed.
    - 1.2.1.3 Sweep paved areas and rake grounds at substantial completion.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate with the Steel, Concrete, Masonry Subcontractors for any attachment details
    - 1.2.3.2 Coordinate with Plumbing Subcontractor for valve box connection to backflow preventor.
    - 1.2.3.3 Coordinate plant selection with the Landscape Architect and provide appropriate notification to team so they may participate in plant selection if desired.
    - 1.2.3.4 Coordinate a planting schedule with the Construction Manager and the Landscape Architect
  - 1.2.4 Landscaping
    - 1.2.4.1 Furnish and install all plantings as required by the documents including but not limited
      - 1.2.4.1.1 All structural soil per the contract documents
      - 1.2.4.1.2 All rocks and boulders
      - 1.2.4.1.3 Evergreen Shrubs
      - 1.2.4.1.4 Evergreen Trees
      - 1.2.4.1.5 Ornamental Grasses
      - 1.2.4.1.6 Ornamental Trees
      - 1.2.4.1.7 Perennials
      - 1.2.4.1.8 Shade Trees
      - 1.2.4.1.9 Shrubs
    - 1.2.4.2 All plantings are to be planted during species specific ideal planting times.
      - 1.2.4.2.1 Provide all planting bed preparation, fertilizing, soil manipulation as required
      - 1.2.4.2.2 Include importation and installation of engineered topsoil as required for planting beds
      - 1.2.4.2.3 Sizes and calipers of all plants/trees are to be as required by the documents.
      - 1.2.4.2.4 All plantings are to be staked as required. Galvanized wire, black plastic

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 32A - LANDSCAPING

hose, and flagging as required. No rubber hose will be permitted

- 1.2.4.2.5 Furnish and install all manufactured edging, trenching, spade edging, and weed barrier as required
- 1.2.4.2.6 Include seeding all disturbed areas due to construction.
- 1.2.4.2.7 Include all metal edging per documents.
- 1.2.4.2.8 Include all excavation of tree or plant wells including haul off of spoils as necessary.
- 1.2.4.2.9 Furnish and install all organic and stone mulch as required
- 1.2.4.2.10 This subcontractor shall furnish a complete planting list.
- 1.2.4.2.11 Any planting substitutions must be reviewed and approved by the Design Team.
- 1.2.4.2.12 Furnish and install all grass seeding, and sod as required
- 1.2.4.2.13 Do not provide sod and turf at the locations flex, softball and football fields. See attached layout for locations and limits of install. Provide at all other locations as per the documents.
- 1.2.4.2.14 Remove construction debris and provide all surface preparation, and fertilizer as required to areas that are to receive sod or seeding.
- 1.2.4.2.15 All disturbed areas are to receive seed as required.
- 1.2.4.2.16 This subcontractor shall be responsible for watering/maintenance of all plant materials until establishment and acceptance by the Owner/Design Team.
- 1.2.4.2.17 All trees are to be limbed up to 8' clear in walkways.
- 1.2.4.2.18 Include all new tree grates as required.
- 1.2.4.2.19 Provide final connections to irrigation lines provided by specialty turf contractor

### 1.2.5 Irrigation

- 1.2.5.1.1 Furnish and install a complete irrigation system
- 1.2.5.1.2 Provide shop drawings/design drawings for the irrigation system to be reviewed and approved by the Design Team.
- 1.2.5.1.3 Provide all piping, fittings, valves/valve boxes, quick couplers, sprinkler heads, drip systems, and all other material required for a complete irrigation system.
- 1.2.5.1.4 Furnish and install all controls, control equipment and associated wiring as required. This subcontractor shall be responsible to make the final electrical and controls connections
- 1.2.5.1.5 Furnish and install all backflow preventers and pits/boxes complete
- 1.2.5.1.6 Final BFP locations are to be coordinated and approved with the Owner.
- 1.2.5.1.7 Provide all sleeves required for this work.
- 1.2.5.1.8 All rain sensors are included as required
- 1.2.5.1.9 Include all tie ins and modifications as necessary.
- 1.2.5.1.10 Provide startup, cleaning, and owner training as required.

### 1.2.6 Unit Rates

- 1.2.6.1.1 Unit rate to add or deduct linear ft. of irrigation

# LEE'S SUMMIT MIDDLE SCHOOL #4

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## 32A - LANDSCAPING

- 1.2.6.1.2 Unit rate to add or deduct tree grates
- 1.2.6.1.3 Unit rate to add or deduct cubic yards of structural soil
- 1.2.6.1.4 Unit rate to add or deduct lbs. of rock and boulders
- 1.2.6.1.5 Unit rate to add or deduct (1) evergreen trees
- 1.2.6.1.6 Unit rate to add or deduct (1) evergreen shrubs
- 1.2.6.1.7 Unit rate to add or deduct (1) ornamental grasses
- 1.2.6.1.8 Unit rate to add or deduct (1) ornamental trees
- 1.2.6.1.9 Unit rate to add or deduct (1) perennials
- 1.2.6.1.10 Unit rate to add or deduct (1) shade trees
- 1.2.7 Exclusions
  - 1.2.7.1 Dumpsters
  - 1.2.7.2 Taxes

# LEE'S SUMMIT MIDDLE SCHOOL #4

## 32B – CHAIN LINK, FENCES AND GATES

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Site Improvements scope in accordance with Division 32 30 00 and 32 31 13 – Chain Link, Fences and Gates including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Subcontractor is responsible for verification of all existing site conditions. Protection of existing structures and underground utilities are included in this Subcontractor's work.
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with Contractor.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate all electrical and low voltage needs with Electrical Subcontractor and Low Voltage Subcontractor respectively as needed.
    - 1.2.3.2 Coordinate with concrete contractor as needed to pour mow strip prior to installation of fencing.
    - 1.2.3.3 Provide all required delegated design shop drawings and calculations signed and sealed by a Professional Engineer licensed in the State of Missouri
  - 1.2.4 Fences, Gates and Access Systems
    - 1.2.4.1 Furnish and install all fences, gates and access systems per documents.
    - 1.2.4.2 Furnish and install all decorative metal gates and fences as per the documents
    - 1.2.4.3 Include all manual swing gates and associated hardware.
    - 1.2.4.4 Include all man gates and associated hardware.
    - 1.2.4.5 Include all new fence per documents.
    - 1.2.4.6 Include post setting including excavation and installation
    - 1.2.4.7 Include double heavy-duty swing gates per documents; include all sensor loops (coordinate with all applicable trades), visuals, pedestals, operators, sensors, etc. for a complete gate and fence package.
    - 1.2.4.8 Furnish and install all hardware, accessories and components necessary for the complete function/capabilities of the security and access control systems as per drawings.
    - 1.2.4.9 All layout as required to complete this scope is included. Control to be provided by others.
    - 1.2.4.10 Include all extra material to be furnished to the owner as per the documents
    - 1.2.4.11 Include owner training to the owner as per the documents.
  - 1.2.5 Unit Cost
    - 1.2.5.1 Unit Cost to add or deduct sq. ft of fencing and chain link
  - 1.2.6 Exclusions
    - 1.2.6.1 Dumpsters
    - 1.2.6.2 Sales Tax

# LEE'S SUMMIT MIDDLE SCHOOL #4

## BID PACKAGE 32C - ASPHALT

### 1. Trade Specific Scope Outline

- 1.1 Subcontractor is responsible for all items outlined and included in Contract Documents and General Provisions. Refer to those sections for additional information.
- 1.2 Furnish and install all work required for the complete and total Asphalt scope in accordance with Division 32 in accordance with the Contract Documents including, but not limited to, the following clarifications:
  - 1.2.1 General
    - 1.2.1.1 Provide cost for asphalt indexing \$ \_\_\_\_\_/liquid ton
  - 1.2.2 Testing requirements
    - 1.2.2.1 Coordinate all inspections of work as required with McCownGordon Construction.
  - 1.2.3 Coordination
    - 1.2.3.1 Coordinate final grading with Earthwork Subcontractor. Include final grading, proof rolling, and final preparations of all paving areas. Sub-grades will have been brought to +/- 1/10". Base course rock is excluded and provided by earthwork contractor,
    - 1.2.3.2 Coordinate final topcoat with McCownGordon Construction and do not perform until directed by McCownGordon Construction in writing
    - 1.2.3.3 Contractor understands that multiple mobilizations for base course and surface course of traffic and track asphalt are required per the contract schedule.
  - 1.2.4 Asphalt
    - 1.2.4.1 Furnish and install the following:
      - 1.2.4.1.1 Include all asphalt paving in compliance with Geotechnical Report, base course, surface course, and compaction
      - 1.2.4.1.2 Included are light traffic and heavy traffic sections per the contract docs
      - 1.2.4.1.3 All pavement striping including striping at concrete pavement locations
        - 1.2.4.1.3.1 Striping at running track is by others.
      - 1.2.4.1.4 All signage and posts
      - 1.2.4.1.5 Contractor has reviewed the contract schedule and understands base course asphalt will install months before surface course. 2 mobilizations are included in Base Bid.
  - 1.2.5 Unit Cost – **NOT INCLUDED IN BASE BID** – See attached drawing for reference
    - 1.2.5.1.1 Unit Cost #1 = 6" MoDOT Type 5 Base course rock and Geogrid
      - 1.2.5.1.1.1 Add \$ \_\_\_\_\_
    - 1.2.5.1.2 Unit Cost #2 = 4" MoDOT Type 5 Base course rock – no Geogrid needed
      - 1.2.5.1.2.1 Add \$ \_\_\_\_\_
    - 1.2.5.1.3 Unit Cost #3 = Cost for an additional mobilization
      - 1.2.5.1.3.1 Add \$ \_\_\_\_\_
  - 1.2.6 Exclusions
    - 1.2.6.1 Asphalt and striping at running track
    - 1.2.6.2 Soil Stabilization
    - 1.2.6.3 Sales Tax

## SECTION 011000 - SUMMARY

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes the following:
  - 1. Work covered by the Contract Documents.
  - 2. Specification formats and conventions.

#### 1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Lee's Summit Middle School #4 Package 3 – Building & Site.
  - 1. Project Location: South of intersection of SE Bailey Road and Country Lane; Lee's Summit, MO; 1001 SE Bailey Road, Lee's Summit, MO 64081.
- B. Owner: Lee's Summit R-7 School District; Tony L. Stansberry Leadership Center; 301 NE Tudor Road; Lee's Summit, MO 64086.
  - 1. Owner's Representative: Kyle Gorrell, Director of Facility Services; Lee's Summit R-7 School District; 502 SE Transport Drive; Lee's Summit, MO 64081; phone 816-986-2420.
- C. Architect: DLR Group Inc., a Missouri corporation.
  - 1. Architect's Representative: Dana M. Schwartz, AIA; DLR Group Inc., a Missouri corporation; 7290 West 133<sup>rd</sup> Street; Overland Park KS 66213.
- D. The Work consists of the following:
  - 1. Package 3: New middle school building and site amenities.
  - 2. Rough grading for the project was issued previously as Package 1.
  - 3. Select structural and site utilities were issued previously as Package 2.

#### 1.4 TYPE OF CONTRACT

- A. Project will be constructed under a Construction Manager as Constructor contract.

## SUMMARY

011000 - 1

## 1.5 WORK SEQUENCE

- A. The Work will be conducted in one phase. Work shall be substantially complete on the date established in the Construction Manager's Manual.
  - 1. If the Contractor fails to complete the Work on or before the Substantial Completion date, Contractor will be liable for liquidated damages as defined in Paragraphs 2.2.10 and 2.2.11 of Document A133 Standard Form of Agreement Between Owner and Construction Manager as Constructor.

## 1.6 USE OF PREMISES

- A. Use of Site: Contractors must limit use of premises to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
  - 1. Limits: Confine constructions operations to areas indicated on the Drawings.

## 1.7 WORK RESTRICTIONS

- A. On-Site Work Hours: Work hours must comply with regulations and laws of authorities having jurisdiction.
  - 1. Hours for Utility Shutdowns: As approved by the Owner, with a minimum of three (3) business days' advance notice.
- B. Existing Utility Interruptions: 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 Architect, Construction Manager and Owner not less than three days in advance of proposed utility interruptions.
  - 2. Do not proceed with utility interruptions without Owner's written permission.

## 1.8 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.
  - 1. Section Identification: The Specifications use Section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available Section numbers are not used. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of Sections in the Contract Documents.
  - 2. Division 01: Sections in Division 01 govern the execution of the Work of all Sections in the Specifications.



- 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000



## SECTION 012300 - ALTERNATES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing Alternates.

#### 1.3 DEFINITIONS

- A. Definition: An alternate is an amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if the Owner decides to accept a corresponding change in either the amount of construction to be completed, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum.

#### 1.4 PROCEDURES

- A. Coordination: Modify or adjust affected adjacent Work as necessary to completely and fully integrate that Work into the Project.
  - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.
- B. Notification: Immediately following the award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate whether alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other Work of this Contract.
- D. Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials necessary to achieve the Work described under each alternate.

## ALTERNATES

012300 - 1

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1-Pkg. 3: North Softball/Baseball Complex Fields

1. Base Bid: Provide sod outfields with infield fines per Contract Documents.
2. Alternate Bid: Provide synthetic turf for both infield and outfield per Contract Documents.

B. Alternate No. 2-Pkg. 3: South Softball/Baseball Complex Fields

1. Base Bid: Provide sod outfields with infield fines per Contract Documents.
2. Alternate Bid: Provide synthetic turf for both infield and outfield per Contract Documents.

C. Alternate No. 3-Pkg. 3: Athletic Lighting

1. Base Bid: Provide conduit and light pole bases to locations indicated in the Contract Documents
2. Alternate Bid: Complete athletic lighting at all fields shown in the Contract Documents.

END OF SECTION 012300

## SECTION 012500 - SUBSTITUTION PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
  - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

#### 1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
  - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

#### 1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit each request to the Architect and Construction Manager as directed in Portable Data Format (PDF) 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 Form 012500A Request for Substitution Form and Form 012500B Contractor's Statement of Conformance, provided in Project Manual.
  - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.

- b. Coordination information, including a list of changes or revisions 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. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
  - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
  - e. Samples, where applicable or requested.
  - f. Certificates and qualification data, where applicable or requested.
  - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
  - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
  - j. 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 date of receipt of purchase order, lack of availability, or delays in delivery.
  - k. Cost information, including a proposal of change, if any, in the Contract Sum.
  - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - m. 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 seven days of receipt of a request for substitution. Architect will notify Contractor through Construction Manager of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

## 1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

## 1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

## PART 2 - PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
  - 1. 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:
    - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - b. Requested substitution provides sustainable design characteristics that specified product provided.
    - c. Substitution request is fully documented and properly submitted.
    - d. Requested substitution will not adversely affect Contractor's construction schedule.
    - e. Requested substitution has received necessary approvals of authorities having jurisdiction.
    - f. Requested substitution is compatible with other portions of the Work.
    - g. Requested substitution has been coordinated with other portions of the Work.
    - h. Requested substitution provides specified warranty.
    - i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.
  - 1. 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:

- a. 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.
- b. Requested substitution does not require extensive revisions to the Contract Documents.
- c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- d. Substitution request is fully documented and properly submitted.
- e. Requested substitution will not adversely affect Contractor's construction schedule.
- f. Requested substitution has received necessary approvals of authorities having jurisdiction.
- g. Requested substitution is compatible with other portions of the Work.
- h. Requested substitution has been coordinated with other portions of the Work.
- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500



**REQUEST FOR SUBSTITUTION FORM  
MUST BE SUBMITTED WITH FORM 012500B  
CONTRACTOR'S STATEMENT OF CONFORMANCE**

TO: **DLR Group**  
7290 West 133<sup>rd</sup> Street  
Overland Park, Kansas 66213  
Phone: 913-897-7811  
Email in PDF format to: [kwalbert@dlrgroup.com](mailto:kwalbert@dlrgroup.com) and [dschwartz@dlrgroup.com](mailto:dschwartz@dlrgroup.com)

PROJECT: LEE'S SUMMIT MIDDLE SCHOOL #4

**CONTRACTOR'S REQUEST, WITH SUPPORTING DATA**

A. Reason for Substitution Request: \_\_\_\_\_  
\_\_\_\_\_

B. Specifications to which this request applies: \_\_\_\_\_  
Section Page Paragraph

☐ Product Data for proposed substitution attached (description of product, reference standards, performance and test data.)

☐ Sample is attached. ☐ Sample will be sent if requested by Architect/Engineer.

C. Itemized comparison of proposed substitution with product specified:

|                        | SPECIFIED PRODUCT | PROPOSED SUBSTITUTION |
|------------------------|-------------------|-----------------------|
| Name/Brand             | _____             | _____                 |
| Catalog/Model No.      | _____             | _____                 |
| Manufacturer           | _____             | _____                 |
| Significant Variations | _____             | _____                 |

D. Unit costs of original product and proposed substitution. State whether cost is for

☐ material only, ☐ material installed, or ☐ Life cycle cost of installed product.

E. Proposed change in Contract Sum:

Credit to Owner: \$ \_\_\_\_\_ Additional Cost to Owner: \$ \_\_\_\_\_

F. Proposed Change in Contract Time: ☐ Reduce ☐ Increase by \_\_\_\_ days ☐ No change

G. Effect of proposed substitution on other parts of the Work, or on other Contracts:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



**CONTRACTOR'S STATEMENT OF CONFORMANCE  
OF PROPOSED SUBSTITUTION TO CONTRACT DOCUMENTS  
MUST BE SUBMITTED WITH FORM 012500A REQUEST FOR SUBSTITUTION**

Email in PDF format to [kwalbert@dlrgroup.com](mailto:kwalbert@dlrgroup.com) and [dschwartz@dlrgroup.com](mailto:dschwartz@dlrgroup.com)

I / We have investigated the proposed substitution. I / We

1. believe that it is equal or superior in all respects to the originally specified product, except as stated in Paragraph C of the Post-Bid Request for Substitution Form;
2. will provide the same warranty as required in AIA A201 General Conditions 3.5.1;
3. will provide the same special warranty or guaranty as specified;
4. have included all cost data and cost implications of the proposed substitution;
5. will pay redesign and special inspection costs caused by the use of this product;
6. will pay additional costs to other contractors caused by the substitution;
7. will coordinate the incorporation of the proposed substitution in the Work;
8. will modify other parts of the Work as may be needed, to make all parts of the Work complete and functioning;
9. waive future claims for added cost to Contractor caused by the proposed substitution.

Contractor: \_\_\_\_\_  
Signature \_\_\_\_\_ Date \_\_\_\_\_  
Firm \_\_\_\_\_ Telephone \_\_\_\_\_  
Address \_\_\_\_\_  
City, State Zip \_\_\_\_\_

**ARCHITECT/ENGINEER'S REVIEW AND ACTION**

- ☐ Provide more information in the following categories. Resubmit.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- ☐ Sign Contractor's Statement of Conformance. Resubmit.
- ☐ The proposed substitution is approved with the following conditions:  
\_\_\_\_\_  
\_\_\_\_\_
- ☐ The proposed substitution request is rejected.

The following changes will be made by Change Order:

Addition to / deduction from the Contract Sum: \$ \_\_\_\_\_

Addition to / deduction from the Contract Time: \_\_\_\_\_ days.

**DLR Group**

By: \_\_\_\_\_ Date: \_\_\_\_\_  
Architect



## SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 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. Section 012500 "Substitution Procedures" 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 costs of labor and supervision directly attributable to the change.

- d. 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 to Architect.
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 costs of labor and supervision directly attributable to the change.
  5. 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.
  6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
- C. Proposal Request Form: Use form acceptable to the Architect.

## 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 Work 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.

LEE'S SUMMIT MIDDLE SCHOOL #4  
PACKAGE 3 – BUILDING & SITE  
LEE'S SUMMIT, MISSOURI

13-20102-00  
8 OCTOBER 2020  
PERMIT SET

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600





## SECTION 012900 - PAYMENT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
  - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

#### 1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

#### 1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
  - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
    - a. Application for Payment forms with Continuation Sheets.
    - b. Submittals Schedule.
    - c. Contractor's Construction Schedule.
  - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:
  - a. Project name and location.
  - b. Name of Architect.
  - c. Architect's project number.
  - d. Contractor's name and address.
  - e. Date of submittal.
2. Submit draft of AIA Document G703 Continuation Sheets.
3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
  - a. Related Specification Section or Division.
  - b. Description of the Work.
  - c. Name of subcontractor.
  - d. Name of manufacturer or fabricator.
  - e. Name of supplier.
  - f. Change Orders (numbers) that affect value.
  - g. Dollar value.
    - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training in the amount of 5 percent of the Contract Sum.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
  - a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing.
7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

- a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
10. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

## 1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
  1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
  1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
  2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit one electronic copy in PDF of each Application for Payment with all attachments to Architect via email as instructed by Architect. Include waivers of lien and similar attachments if required. Combine files into one PDF. Do not submit multiple electronic files.
  1. Confirm receipt of pay application by response email or other method as instructed by the Architect.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
  1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
  2. When an application shows completion of an item, submit final or full waivers.

3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
  4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- G. Certified Payroll: With each Application for Payment, submit certified payroll in conformance with the provisions and requirements at the time of submission, of the State of Missouri, Division of Labor Standards, Annual Wage Order, in accordance with Section 290.262 CUM. Supp. RSMo (1994) and any other statutes or requirements that may be in effect at the time of submission.
1. Public Works During Excessive Unemployment: Submit all documentation showing compliance in accordance with the provisions and requirements of the Missouri Prevailing Wage Law Sections 290.550 to 290.580 Public Works During Excessive Unemployment, if such provision applies to this Project.
- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
  2. Schedule of Values.
  3. Contractor's Construction Schedule (preliminary if not final).
  4. Products list.
  5. Schedule of unit prices.
  6. Submittals Schedule (preliminary if not final).
  7. List of Contractor's staff assignments.
  8. List of Contractor's principal consultants.
  9. Copies of building permits.
  10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  11. Initial progress report.
  12. Report of preconstruction conference.
  13. Certificates of insurance and insurance policies.
  14. Performance and payment bonds.
  15. Data needed to acquire Owner's insurance.
  16. Initial settlement survey and damage report if required.
- I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.

2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900



## SECTION 013100 - 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 01 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. Coordination drawings.
  - 2. Administrative and supervisory personnel.
  - 3. Project meetings.
  - 4. Requests for Interpretation (RFIs).
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Related Sections include the following:
  - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's Construction Schedule.
  - 2. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

#### 1.3 COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that 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. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

- B. 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. Project closeout activities.
  - 7. Startup and adjustment of systems.
  - 8. Project closeout activities.

#### 1.4 SUBMITTALS

- A. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
  - 1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

#### 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: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.



- B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 10 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; 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. Critical work sequencing and long-lead items.
    - c. Designation of key personnel and their duties.
    - d. Procedures for processing field decisions and Change Orders.
    - e. Procedures for RFIs.
    - f. Procedures for testing and inspecting.
    - g. Procedures for processing Applications for Payment.
    - h. Distribution of the Contract Documents.
    - i. Submittal procedures.
    - j. Preparation of Record Documents.
    - k. Use of the premises.
    - l. Work restrictions.
    - m. Owner's occupancy requirements.
    - n. Responsibility for temporary facilities and controls.
    - o. Construction waste management and recycling.
    - p. Parking availability.
    - q. Office, work, and storage areas.
    - r. Equipment deliveries and priorities.
    - s. First aid.
    - t. Security.
    - u. Progress cleaning.
    - v. Working hours.
  3. Minutes: Record and distribute meeting minutes.
- C. Progress Meetings: Conduct progress meetings at biweekly 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.
  - 1) Review schedule for next period.
- 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) Status of correction of deficient items.
  - 14) Field observations.
  - 15) RFIs.
  - 16) Status of proposal requests.
  - 17) Pending changes.
  - 18) Status of Change Orders.
  - 19) Pending claims and disputes.
  - 20) Documentation of information for payment requests.
3. Minutes: Record the meeting minutes.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
  - 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.

## 1.6 REQUESTS FOR INTERPRETATION (RFIs)

- A. Procedure: Immediately on discovery of the need for interpretation of the Contract Documents, and if not possible to request interpretation at Project meeting, prepare and submit an RFI in the form specified.
  1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.

2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing interpretation and the following:
1. Project name.
  2. Date.
  3. Name of Contractor.
  4. Name of Architect.
  5. RFI number, numbered sequentially.
  6. Specification Section number and title and related paragraphs, as appropriate.
  7. Drawing number and detail references, as appropriate.
  8. Field dimensions and conditions, as appropriate.
  9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
  10. Contractor's signature.
  11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
    - a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Submittal to Architect: Submit RFI's in Adobe Acrobat PDF electronic file format via web-based project management software as directed by the Architect.
1. Attachments shall be electronic files in Adobe Acrobat PDF format appended to the RFI PDF electronic file so that it is a single electronic file, and named as directed by the Architect. Multiple files will be returned without response. Files that are not compliant with the agreed upon file nomenclature will be returned without response.
- D. Architect's Action: Architect will review each RFI, determine action required, and return it. Allow seven working days for Architect's response for each RFI. RFIs received after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
    - a. Requests for approval of submittals.
    - b. Requests for approval of substitutions.
    - c. Requests for coordination information already indicated in the Contract Documents.
    - d. Requests for adjustments in the Contract Time or the Contract Sum.
    - e. Requests for interpretation of Architect's actions on submittals.
    - f. Incomplete RFIs or RFIs with numerous errors.
    - g. RFIs submitted in a format or manner not compliant with the requirements stated herein.

2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 013200 "Contract Modification Procedures."
  - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within five days of receipt of the RFI response.
- E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at every progress meeting. Software log with not less than the following:
  1. Project name.
  2. Name and address of Contractor.
  3. Name and address of Architect.
  4. RFI number including RFIs that were dropped and not submitted.
  5. RFI description.
  6. Date the RFI was submitted.
  7. Date Architect's response was received.
  8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
  9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

## SECTION 013200 - 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 01 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. Preliminary construction schedule.
  - 2. Contractor's construction schedule.
  - 3. Submittals schedule.
  - 4. Daily construction reports.
  - 5. Material location reports.
  - 6. Field condition reports.
  - 7. Special reports.
- B. Related Sections include the following:
  - 1. Section 012900 "Payment Procedures" for submitting the Schedule of Values.
  - 2. Section 013100 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
  - 3. Section 013300 "Submittal Procedures" for submitting schedules and reports.
  - 4. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

#### 1.3 SUBMITTALS

- A. Submittals Schedule: Submit to Architect in Excel and PDF format. 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. Preliminary Construction Schedule: Submit in PDF format; one file.

- C. Contractor's Construction Schedule: Submit initial schedule in PDF format, large enough to show entire schedule for entire construction period.
  - 1. Submit an electronic copy of schedule in PDF format, labeled to comply with requirements for submittals. Include type of schedule (Initial or Updated) and date.
- D. Daily Construction Reports: Submit at weekly intervals.
- E. Field Condition Reports: Submit at time of discovery of differing conditions.
- F. Special Reports: Submit at time of unusual event.

#### 1.4 QUALITY ASSURANCE

- A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:
  - 1. Review software limitations and content and format for reports.
  - 2. Verify availability of qualified personnel needed to develop and update schedule.
  - 3. Discuss constraints, including phasing, work stages, area separations, interim milestones and partial Owner occupancy.
  - 4. Review delivery dates for Owner-furnished products.
  - 5. Review schedule for work of Owner's separate contracts.
  - 6. Review time required for review of submittals and resubmittals.
  - 7. Review time required for completion and startup procedures.
  - 8. Review and finalize list of construction activities to be included in schedule.
  - 9. Review submittal requirements and procedures.
  - 10. Review procedures for updating schedule.

#### 1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- 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 in Excel and PDF format, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, 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. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
    - a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.
  3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

### 2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
  2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
  4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.

- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
  - 1. Phasing: Arrange list of activities on schedule by phase.
  - 2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
  - 3. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.
- F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

## 2.3 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

## 2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
  - 1. List of subcontractors at Project site.
  - 2. List of separate contractors at Project site.
  - 3. Approximate count of personnel at Project site.
  - 4. Equipment at Project site.
  - 5. Material deliveries.
  - 6. High and low temperatures and general weather conditions.
  - 7. Accidents.
  - 8. Meetings and significant decisions.
  - 9. Unusual events (refer to special reports).
  - 10. Stoppages, delays, shortages, and losses.
  - 11. Meter readings and similar recordings.
  - 12. Emergency procedures.
  - 13. Orders and requests of authorities having jurisdiction.
  - 14. Change Orders received and implemented.
  - 15. Construction Change Directives received and implemented.



16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial Completions and occupancies.
19. Substantial Completions authorized.

- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

## 2.5 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner and Architect within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner and Architect in advance when these events are known or predictable.

## 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, testing and 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.

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PACKAGE 3 – BUILDING & SITE  
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END OF SECTION 013200

## SECTION 013300 - 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 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
  - 1. Division 01 Sections for the following:
    - a. Submittal of Applications for Payment and the schedule of values.
    - b. Submittal of schedules and reports, including Contractor's construction schedule.
    - c. Submittal of operation and maintenance manuals.
    - d. Submittal of record Drawings, record Specifications, and record Product Data.
    - e. Submittal of materials related to demonstration of equipment and training of Owner's personnel.

#### 1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's and Construction Manager's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's and Construction Manager's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."
- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

#### 1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and Construction Manager and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
  2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
  3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
    - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
  4. Format: Arrange the following information in a tabular format:
    - a. Scheduled date for first submittal.
    - b. Specification Section number and title.
    - c. Submittal category: Action; informational.
    - d. Name of subcontractor.
    - e. Description of the Work covered.
    - f. Scheduled date for Architect's and Construction Manager's final release or approval.
    - g. Scheduled date of fabrication.
    - h. Scheduled dates for purchasing.
    - i. Scheduled dates for installation.
    - j. Activity or event number.

#### 1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Comply with requirements of Section 013333 "Electronic Drawings."
1. Architect makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
  3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
  4. 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 and Construction Manager reserve the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Construction Manager will advise Contractor when a submittal being processed must be delayed for coordination.
  2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
  3. Resubmittal Review: Allow 15 days for review of each resubmittal.
  4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 21 days for initial review of each submittal.
- D. Paper Submittals: Paper submittals will not be accepted unless specifically requested by the Construction Manager and Architect.
- E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
  2. Name file with submittal number, including revision identifier, as follows:
    - a. File name shall use Specification Section number followed by a dash and then a sequential two-digit number (e.g., 061000-01). Resubmittals shall include an sequential suffix after another dash (e.g., 061000-01-1).
  3. Provide adequate space for insertion to permanently record Contractor's review and approval markings and action taken by Architect and Construction Manager.
  4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Construction Manager, containing the following information:
    - a. Project name.
    - b. Date.
    - c. Name and address of Architect.

- d. Name of Construction Manager.
  - e. Name of Contractor.
  - f. Name of firm or entity that prepared submittal.
  - g. Names of subcontractor, manufacturer, and supplier.
  - h. Category and type of submittal.
  - i. Submittal purpose and description.
  - j. Specification Section number and title.
  - k. Specification paragraph number or drawing designation and generic name for each of multiple items.
  - l. Drawing number and detail references, as appropriate.
  - m. Location(s) where product is to be installed, as appropriate.
  - n. Related physical samples submitted directly.
  - o. Indication of full or partial submittal.
  - p. Transmittal number, numbered consecutively.
  - q. Submittal and transmittal distribution record.
  - r. Other necessary identification.
  - s. Remarks.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
- a. Project name.
  - b. Number and title of appropriate Specification Section.
  - c. Manufacturer name.
  - d. Product name.
- F. Options: Identify options requiring selection by Architect.
- G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect and Construction Manager on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- H. Resubmittals: Make resubmittals in same form as initial submittal.
1. Note date and content of previous submittal.
  2. Note date and content of revision in label or title block and clearly indicate extent of revision.
  3. Resubmit submittals until they are marked as "Reviewed" or "Furnish As Corrected" with Architect's action stamp.
- I. 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.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's and Construction Manager's action stamp.

## PART 2 - PRODUCTS

### 2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
1. Upload electronic submittals as single PDF electronic files directly to Architect's secure web-based site specifically established for Project.
    - a. Architect will return annotated file to Construction Manager. Annotate and retain one copy of file as an electronic Project record document file.
  2. Certificates and Certifications Submittals: Provide a 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.
    - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
    - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.
- 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 published data are not suitable for use, submit as Shop Drawings, not as Product Data.
  2. Mark each submittal to show which products and options are applicable.
  3. Include the following information, as applicable:
    - a. Manufacturer's catalog cuts.
    - b. Manufacturer's product specifications.
    - c. Standard color charts.
    - d. Statement of compliance with specified referenced standards.
    - e. Testing by recognized testing agency.
    - f. Application of testing agency labels and seals.
    - g. Notation of coordination requirements.
    - h. Availability and delivery time information.
  4. For equipment, include the following in addition to the above, as applicable:
    - a. Wiring diagrams showing factory-installed wiring.
    - b. Printed performance curves.
    - c. Operational range diagrams.
    - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

## SUBMITTAL PROCEDURES

013300 - 5

5. Submit Product Data before or concurrent with Samples.
  6. Submit Product Data in the following format:
    - a. Single PDF electronic file.
- 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, unless submittal based on Architect's digital data drawing files is otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
    - a. Identification of products.
    - b. Schedules.
    - c. Compliance with specified standards.
    - d. Notation of coordination requirements.
    - e. Notation of dimensions established by field measurement.
    - f. Relationship and attachment to adjoining construction clearly indicated.
    - g. Seal and signature of professional engineer if specified.
  2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm), but no larger than 30 by 42 inches (750 by 1067 mm).
  3. Submit Shop Drawings in the following format:
    - a. Single PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
  2. Identification: Attach label on unexposed side of Samples that includes the following:
    - a. Generic description of Sample.
    - b. Product name and name of manufacturer.
    - c. Sample source.
    - d. Number and title of applicable Specification Section.
    - e. Specification paragraph number and generic name of each item.
  3. Upload corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
  4. 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.



- a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
  - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
5. 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. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect, through Construction Manager, will return submittal with options selected.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: 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 used for independent testing and inspection.
  - a. Number of Samples: Submit three sets of Samples. Architect and Construction Manager will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
    - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
    - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
  1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
  2. Manufacturer and product name, and model number if applicable.
  3. Number and name of room or space.
  4. Location within room or space.
  5. Submit product schedule in the following format:
    - a. Single PDF electronic file.
- F. Coordination Drawing Submittals: Comply with requirements in Division 01 Sections.

- G. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Sections.
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Division 01 Sections.
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Division 01 Sections.
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Sections.
- K. Maintenance Data: Comply with requirements specified in Division 01 Sections.
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. 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.
- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
  2. Date of evaluation.
  3. Time period when report is in effect.
  4. Product and manufacturers' names.
  5. Description of product.
  6. Test procedures and results.
  7. Limitations of use.
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit 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.
- W. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Design Data: Prepare and submit 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.

## 2.2 DELEGATED-DESIGN SERVICES

- 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.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally signed PDF electronic file of certificate, 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.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect and Construction Manager.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Division 01 Sections.
- C. 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 AND CONSTRUCTION MANAGER'S ACTION

- A. Action Submittals: Architect and Construction Manager will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect and Construction Manager will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect and Construction Manager will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect and Construction Manager will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect and Construction Manager.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 013300

## SECTION 013333 – ELECTRONIC DRAWINGS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. The Architect-Engineer, if requested, may provide electronic copies of the Drawings in AutoCAD format as determined by the Architect-Engineer. The files, if provided, are for the Receiving Party's convenience in performing the Work.
- B. Architect-Engineer, at its sole discretion and without penalty, reserves the right to deny electronic files to any contractor, subcontractor, supplier or other firm.
- C. Receiving Party must complete, sign and transmit to Architect AIA Document C106-2013 Digital Data Licensing Agreement found at the end of this Section. Files will not be compiled or transmitted until completed and signed document is received.
- D. Receiving Party shall allow the Architect-Engineer a minimum of fourteen business days to compile and transmit electronic drawings after signed Digital Data Licensing Agreement is received. Receiving Party shall also allow an additional time period of seven business days to determine that the files are compatible with the Contractor's computer operating systems and software, and to allow for corrections to be made if necessary. Receiving Party is solely responsible for requesting files in a timely manner so as to ensure there is no delay in the Work.
- E. Under no circumstances is Architect-Engineer responsible in whole or in part for any delay in the Work due to timeliness or functionality of electronic documents transmitted to or received by any party.

#### 1.3 REFERENCES

- A. A copy of the Architect's AIA Document C106-2013 Digital Licensing Agreement is included at the end of the Section.

LEE'S SUMMIT MIDDLE SCHOOL #4  
PACKAGE 3 – BUILDING & SITE  
LEE'S SUMMIT, MISSOURI

13-20102-00  
8 OCTOBER 2020  
PERMIT SET

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013333



# AIA<sup>®</sup> Document C106<sup>™</sup> – 2013

## Digital Data Licensing Agreement

**AGREEMENT** made as of the \_\_\_\_\_ day of \_\_\_\_\_ in the year \_\_\_\_\_  
(In words, indicate day, month and year.)

**BETWEEN** the Party transmitting Digital Data ("Transmitting Party"):  
(Name, address and contact information, including electronic addresses)

DLR Group inc.  
7290 West 133<sup>rd</sup> Street  
Overland Park, KS 66213

and the Party receiving the Digital Data ("Receiving Party"):  
(Name, address and contact information, including electronic addresses)

for the following Project:  
(Name and location or address)

Lee's Summit Middle School #4  
Lee's Summit R-7 School District  
Lee's Summit, Missouri

The Transmitting Party and Receiving Party agree as follows.

### TABLE OF ARTICLES

- 1 GENERAL PROVISIONS
- 2 TRANSMISSION OF DIGITAL DATA
- 3 LICENSE CONDITIONS
- 4 LICENSING FEE OR OTHER COMPENSATION
- 5 DIGITAL DATA

### ARTICLE 1 GENERAL PROVISIONS

§ 1.1 The purpose of this Agreement is to grant a license from the Transmitting Party to the Receiving Party for the Receiving Party's use of Digital Data on the Project, and to set forth the license terms.

§ 1.2 This Agreement is the entire and integrated agreement between the parties. Except as specifically set forth herein, this Agreement does not create any other contractual relationship between the parties.

### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

§ 1.3 For purposes of this Agreement, the term Digital Data is defined to include only those items identified in Article 5 below.

§ 1.3.1 Confidential Digital Data is defined as Digital Data containing confidential or business proprietary information that the Transmitting Party designates and clearly marks as "confidential."

## ARTICLE 2 TRANSMISSION OF DIGITAL DATA

§ 2.1 The Transmitting Party grants to the Receiving Party a nonexclusive limited license to use the Digital Data identified in Article 5 solely and exclusively to perform services for, or construction of, the Project in accordance with the terms and conditions set forth in this Agreement.

§ 2.2 The transmission of Digital Data constitutes a warranty by the Transmitting Party to the Receiving Party that the Transmitting Party is the copyright owner of the Digital Data, or otherwise has permission to transmit the Digital Data to the Receiving Party for its use on the Project in accordance with the terms and conditions of this Agreement.

§ 2.3 If the Transmitting Party transmits Confidential Digital Data, the transmission of such Confidential Digital Data constitutes a warranty to the Receiving Party that the Transmitting Party is authorized to transmit the Confidential Digital Data. If the Receiving Party receives Confidential Digital Data, the Receiving Party shall keep the Confidential Digital Data strictly confidential and shall not disclose it to any other person or entity except as set forth in Section 2.3.1.

§ 2.3.1 The Receiving Party may disclose the Confidential Digital Data as required by law or court order, including a subpoena or other form of compulsory legal process issued by a court or governmental entity. The Receiving Party may also disclose the Confidential Digital Data to its employees, consultants or contractors in order to perform services or work solely and exclusively for the Project, provided those employees, consultants and contractors are subject to the restrictions on the disclosure and use of Confidential Digital Data as set forth in this Agreement.

§ 2.4 The Transmitting Party retains its rights in the Digital Data. By transmitting the Digital Data, the Transmitting Party does not grant to the Receiving Party an assignment of those rights; nor does the Transmitting Party convey to the Receiving Party any right in the software used to generate the Digital Data.

§ 2.5 To the fullest extent permitted by law, the Receiving Party shall indemnify and defend the Transmitting Party from and against all claims arising from or related to the Receiving Party's modification to, or unlicensed use of, the Digital Data.

## ARTICLE 3 LICENSE CONDITIONS

The parties agree to the following conditions on the limited license granted in Section 2.1:

*(State below rights or restrictions applicable to the Receiving Party's use of the Digital Data, requirements for data format, transmission method or other conditions on data to be transmitted.)*

§ 3.1 Architect-Engineer of Record (AER) makes no representation as to the compatibility of the Computer Aided Drafting/Building Information Model (CAD/BIM) files with any hardware or software.

§ 3.2 AER makes no representation regarding the accuracy, completeness, or permanence of CAD/BIM files, or for their merchantability or fitness for a particular purpose. Addenda information or revisions made after the date indicated on the CAD/BIM files may not have been incorporated. In the event of a conflict between the AER's sealed Contract Drawings and CAD/BIM files, the sealed Contract Drawings shall govern. It is the Contractor or Third Party's (OCT) responsibility to determine if any conflicts exist. The CAD/BIM files shall not be considered to be Contract Documents as defined by the General Conditions of the Contract for Construction.

§ 3.3 The use of CAD/BIM files prepared by the AER shall not in any way obviate the OCT's responsibility for the proper checking and coordination of dimensions, details, member sizes and gage, and quantities of materials as required to facilitate complete and accurate fabrication and erection.

§ 3.4 This Agreement shall be governed by the laws of the State of Missouri.



#### ARTICLE 4 LICENSING FEE OR OTHER COMPENSATION

*(Paragraph deleted)*

§ 4.1 Parties agree that there will be no compensation for files transmitted for the Work of this Project. Receiving Party agrees that under no circumstances will any claim for additional time or contract sum be allowed due to the transmission of the files under this Agreement. Furthermore, while Transmitting Party will attempt to transmit files requested in the time frame requested by the Receiving Party, Transmitting Party is under no obligation to meet any such schedule requirement. The Receiving Party is solely responsible for submitting a request for files in within a time period such that any delay in transmission does not impact the project schedule.

#### ARTICLE 5 DIGITAL DATA

The Parties agree that the following items constitute the Digital Data subject to the license granted in Section 2.1: *(Identify below, in detail, the information created or stored in digital form the parties intend to be subject to this Agreement.)*

All files transmitted for the Work of this Project.

This Agreement is entered into as of the day and year first written above and will terminate upon Substantial Completion of the Project, as that term is defined in AIA Document A201™–2007, General Conditions of the Contract for Construction.

*(Indicate when this Agreement will terminate, if other than the date of Substantial Completion.)*

\_\_\_\_\_  
TRANSMITTING PARTY *(Signature)*

Scott T. Pashia, AIA, Vice President, DLR Group  
inc.

\_\_\_\_\_  
*(Printed name and title)*

\_\_\_\_\_  
RECEIVING PARTY *(Signature)*

\_\_\_\_\_  
*(Printed name and title)*



## SECTION 014000 - 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 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
  - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
  - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
  - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
  - 1. Section 013200 "Construction Progress Documentation" for developing a schedule of required tests and inspections.
  - 2. Section 017329 "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
  - 3. Divisions 02 through 49 Sections for specific test and inspection requirements.
  - 4. Lee's Summit Design Criteria and Standard Specifications

#### 1.3 CONFLICTING REQUIREMENTS

- A. General: 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.

- B. 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.

#### 1.4 SUBMITTALS

- A. Qualification Data: For testing 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 testing agency by a recognized authority.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
  2. Description of test and inspection.
  3. Identification of applicable standards.
  4. Identification of test and inspection methods.
  5. Number of tests and inspections required.
  6. Time schedule or time span for tests and inspections.
  7. Entity responsible for performing tests and inspections.
  8. Requirements for obtaining samples.
  9. Unique characteristics of each quality-control service.
- C. Reports: Prepare and submit certified written reports that include the following:
1. Date of issue.
  2. Project title and number.
  3. Name, address, and telephone number of testing agency.
  4. Dates and locations of samples and tests or inspections.
  5. Names of individuals making tests and inspections.
  6. Description of the Work and test and inspection method.
  7. Identification of product and Specification Section.
  8. Complete test or inspection data.
  9. Test and inspection results and an interpretation of test results.
  10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
  11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
  12. Name and signature of laboratory inspector.
  13. Recommendations on retesting and reinspecting.
- 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.

## 1.5 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. 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.
- C. 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, as well as sufficient production capacity to produce required units.
- D. 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.
- 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 who 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 regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
  - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
  - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. 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.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
  - 1. Contractor responsibilities include the following:

- a. Provide test specimens representative of proposed products and construction.
    - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
    - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    - f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
  2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. 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.
    - a. Allow seven days for initial review and each re-review of each mockup.
  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.

## 1.6 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
  2. Payment for these services will be made from testing and inspecting allowances, as authorized by Change Orders.
  3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

- B. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
    - a. Contractor shall not employ 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. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
  2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
  3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
  4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
  5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
  6. Do not perform any duties of Contractor.
- E. Associated Services: Cooperate with agencies performing required tests, 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. Delivery of samples to testing agencies.
  6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
  7. Security and protection for samples and for testing and inspecting equipment at Project site.
- F. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -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.
- G. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

#### 1.7 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:
- B. Special Tests and Inspections: Conducted by a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:
1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
  2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
  3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
  4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
  5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
  6. Retesting and reinspecting corrected work.

#### PART 2 - PRODUCTS (Not Used)



## PART 3 - EXECUTION

### 3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
  - 1. Date test or inspection was conducted.
  - 2. Description of the Work tested or inspected.
  - 3. Date test or inspection results were transmitted to Architect.
  - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

### 3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, 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 Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
  - 2. Comply with the Contract Document requirements for Section 017300 "Execution."
- 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.

### 3.3 SCHEDULES

- A. Testing is required by applicable code. See the following Sections and the Drawings:
  - 1. Section 033000 "Cast-in-Place Concrete."
  - 2. Section 034100 "Precast Structural Concrete."
  - 3. Section 042000 "Unit Masonry."
  - 4. Section 051200 "Structural Steel Framing."
  - 5. Section 052100 "Steel Joist Framing"
  - 6. Section 053100 "Steel Decking."
  - 7. Section 312000 "Earthwork."
- B. Special inspections are specified in the following sections, and shall be performed by the indicated party:
  - 1. LS Section 2100 "Grading and Site Preparation"
  - 2. LS Section 2150 "Erosion and Sediment Control"

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3. LS Section 2200 "Paving."
4. LS Section 2600 "Storm Sewers."
5. LS Section 3500 "Sanitary Sewers."
6. LS Section 3900 "Water Mains."

END OF SECTION 014000

## SECTION 014200 - REFERENCES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": 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": Furnish and install, complete and ready for the intended use.
- I. "Project Site": 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

## REFERENCES

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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. Copies of Standards: Each entity engaged in construction on Project should 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.

#### 1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. 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 sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

|        |   |                |
|--------|---|----------------|
| AABC   | Associated Air Balance Council<br>www.aabc.com  | (202) 737-0202 |
| AAMA   | American Architectural Manufacturers Association<br>www.aamanet.org                             | (847) 303-5664 |
| AASHTO | American Association of State Highway and Transportation<br>Officials<br>www.transportation.org | (202) 624-5800 |
| AATCC  | American Association of Textile Chemists and Colorists<br>www.aatcc.org                         | (919) 549-8141 |
| ABMA   | American Bearing Manufacturers Association<br>www.americanbearings.org                          | (202) 367-1155 |
| ACI    | American Concrete Institute<br>(Formerly: ACI International)<br>www.concrete.org                | (248) 848-3700 |
| ACPA   | American Concrete Pipe Association<br>www.concrete-pipe.org                                     | (972) 506-7216 |

#### REFERENCES

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|       |   |                                  |
|-------|---|----------------------------------|
| AEIC  | Association of Edison Illuminating Companies, Inc. (The)<br>www.aeic.org        | (205) 257-2530                   |
| AF&PA | American Forest & Paper Association<br>www.afandpa.org                          | (800) 878-8878<br>(202) 463-2700 |
| AGA   | American Gas Association<br>www.aga.org   | (202) 824-7000                   |
| AHAM  | Association of Home Appliance Manufacturers<br>www.aham.org                     | (202) 872-5955                   |
| AHRI  | Air-Conditioning, Heating, and Refrigeration Institute (The)<br>www.ahrinet.org | (703) 524-8800                   |
| AI    | Asphalt Institute<br>www.asphaltinstitute.org                                   | (859) 288-4960                   |
| AIA   | American Institute of Architects (The)<br>www.aia.org                           | (800) 242-3837<br>(202) 626-7300 |
| AISC  | American Institute of Steel Construction<br>www.aisc.org                        | (800) 644-2400<br>(312) 670-2400 |
| AISI  | American Iron and Steel Institute<br>www.steel.org                              | (202) 452-7100                   |
| AITC  | American Institute of Timber Construction<br>www.aitc-glulam.org                | (303) 792-9559                   |
| AMCA  | Air Movement and Control Association International, Inc.<br>www.amca.org        | (847) 394-0150                   |
| ANSI  | American National Standards Institute<br>www.ansi.org                           | (202) 293-8020                   |
| AOSA  | Association of Official Seed Analysts, Inc.<br>www.aosaseed.com                 | (607) 256-3313                   |
| APA   | APA - The Engineered Wood Association<br>www.apawood.org                        | (253) 565-6600                   |
| APA   | Architectural Precast Association<br>www.archprecast.org                        | (239) 454-6989                   |
| API   | American Petroleum Institute<br>www.api.org                                     | (202) 682-8000                   |

## REFERENCES

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|          |   |                                  |
|----------|---|----------------------------------|
| ARI      | Air-Conditioning & Refrigeration Institute<br>(See AHRI)  |                                  |
| ARI      | American Refrigeration Institute<br>(See AHRI)  |                                  |
| ARMA     | Asphalt Roofing Manufacturers Association<br><a href="http://www.asphaltroofing.org">www.asphaltroofing.org</a>                     | (202) 207-0917                   |
| ASCE     | American Society of Civil Engineers<br><a href="http://www.asce.org">www.asce.org</a>   | (800) 548-2723<br>(703) 295-6300 |
| ASCE/SEI | American Society of Civil Engineers/Structural Engineering<br>Institute<br>(See ASCE)   |                                  |
| ASHRAE   | American Society of Heating, Refrigerating and Air-<br>Conditioning Engineers<br><a href="http://www.ashrae.org">www.ashrae.org</a> | (800) 527-4723<br>(404) 636-8400 |
| ASME     | ASME International<br>(American Society of Mechanical Engineers)<br><a href="http://www.asme.org">www.asme.org</a>                  | (800) 843-2763<br>(973) 882-1170 |
| ASSE     | American Society of Safety Engineers (The)<br><a href="http://www.asse.org">www.asse.org</a>  | (847) 699-2929                   |
| ASSE     | American Society of Sanitary Engineering<br><a href="http://www.asse-plumbing.org">www.asse-plumbing.org</a>                        | (440) 835-3040                   |
| ASTM     | ASTM International<br>(American Society for Testing and Materials International)<br><a href="http://www.astm.org">www.astm.org</a>  | (610) 832-9500                   |
| ATIS     | Alliance for Telecommunications Industry Solutions<br><a href="http://www.atis.org">www.atis.org</a>                                | (202) 628-6380                   |
| AWEA     | American Wind Energy Association<br><a href="http://www.awea.org">www.awea.org</a>  | (202) 383-2500                   |
| AWI      | Architectural Woodwork Institute<br><a href="http://www.awinet.org">www.awinet.org</a>  | (571) 323-3636                   |
| AWMAC    | Architectural Woodwork Manufacturers Association of<br>Canada<br><a href="http://www.awmac.com">www.awmac.com</a>                   | (403) 453-7387                   |
| AWPA     | American Wood Protection Association<br>(Formerly: American Wood-Preservers' Association)   | (205) 733-4077                   |

## REFERENCES

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|       |  |                                  |
|-------|--|----------------------------------|
|       | www.awpa.com   |                                  |
| AWS   | American Welding Society<br>www.aws.org  | (800) 443-9353<br>(305) 443-9353 |
| AWWA  | American Water Works Association<br>www.awwa.org   | (800) 926-7337<br>(303) 794-7711 |
| BHMA  | Builders Hardware Manufacturers Association<br>www.buildershardware.com                                      | (212) 297-2122                   |
| BIA   | Brick Industry Association (The)<br>www.gobrick.com  | (703) 620-0010                   |
| BICSI | BICSI, Inc.<br>www.bicsi.org   | (800) 242-7405<br>(813) 979-1991 |
| BIFMA | BIFMA International<br>(Business and Institutional Furniture Manufacturer's<br>Association)<br>www.bifma.com | (616) 285-3963                   |
| BISSC | Baking Industry Sanitation Standards Committee<br>www.bissc.org  | (866) 342-4772                   |
| BOCA  | BOCA<br>(Building Officials and Code Administrators International<br>Inc.)<br>(See ICC)                      |                                  |
| BWF   | Badminton World Federation<br>(Formerly: International Badminton Federation)<br>www.bwfbadminton.org         | 60 3 9283 7155                   |
| CDA   | Copper Development Association<br>www.copper.org   | (800) 232-3282<br>(212) 251-7200 |
| CEA   | Canadian Electricity Association<br>www.electricity.ca   | (613) 230-9263                   |
| CEA   | Consumer Electronics Association<br>www.ce.org   | (866) 858-1555<br>(703) 907-7600 |
| CFFA  | Chemical Fabrics & Film Association, Inc.<br>www.chemicalfabricsandfilm.com                                  | (216) 241-7333                   |
| CFSEI | Cold-Formed Steel Engineers Institute<br>www.cfsei.org   | (866) 465-4732<br>(202) 263-4488 |

## REFERENCES

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|       |  |                                  |
|-------|--|----------------------------------|
| CGA   | Compressed Gas Association<br><a href="http://www.cganet.com">www.cganet.com</a>   | (703) 788-2700                   |
| CIMA  | Cellulose Insulation Manufacturers Association<br><a href="http://www.cellulose.org">www.cellulose.org</a>   | (888) 881-2462<br>(937) 222-2462 |
| CISCA | Ceilings & Interior Systems Construction Association<br><a href="http://www.cisca.org">www.cisca.org</a>   | (630) 584-1919                   |
| CISPI | Cast Iron Soil Pipe Institute<br><a href="http://www.cispi.org">www.cispi.org</a>  | (404) 622-0073                   |
| CLFMI | Chain Link Fence Manufacturers Institute<br><a href="http://www.chainlinkinfo.org">www.chainlinkinfo.org</a>                                       | (301) 596-2583                   |
| CPA   | Composite Panel Association<br><a href="http://www.pbmdf.com">www.pbmdf.com</a>  | (703) 724-1128                   |
| CRI   | Carpet and Rug Institute (The)<br><a href="http://www.carpet-rug.org">www.carpet-rug.org</a>   | (706) 278-3176                   |
| CRRC  | Cool Roof Rating Council<br><a href="http://www.coolroofs.org">www.coolroofs.org</a>   | (866) 465-2523<br>(510) 485-7175 |
| CRSI  | Concrete Reinforcing Steel Institute<br><a href="http://www.crsi.org">www.crsi.org</a>   | (800) 328-6306<br>(847) 517-1200 |
| CSA   | Canadian Standards Association<br><a href="http://www.csa.ca">www.csa.ca</a>   | (800) 463-6727<br>(416) 747-4000 |
| CSA   | CSA International<br>(Formerly: IAS - International Approval Services)<br><a href="http://www.csa-international.org">www.csa-international.org</a> | (866) 797-4272<br>(416) 747-4000 |
| CSI   | Construction Specifications Institute (The)<br><a href="http://www.csinet.org">www.csinet.org</a>  | (800) 689-2900<br>(703) 684-0300 |
| CSSB  | Cedar Shake & Shingle Bureau<br><a href="http://www.cedarbureau.org">www.cedarbureau.org</a>   | (604) 820-7700                   |
| CTI   | Cooling Technology Institute<br>(Formerly: Cooling Tower Institute)<br><a href="http://www.cti.org">www.cti.org</a>                                | (281) 583-4087                   |
| CWC   | Composite Wood Council<br>(See CPA)  |                                  |
| DASMA | Door and Access Systems Manufacturers Association<br><a href="http://www.dasma.com">www.dasma.com</a>  | (216) 241-7333                   |

## REFERENCES

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|              |  |                                    |
|--------------|--|------------------------------------|
| DHI          | Door and Hardware Institute<br><a href="http://www.dhi.org">www.dhi.org</a>  | (703) 222-2010                     |
| ECA          | Electronic Components Association<br><a href="http://www.ec-central.org">www.ec-central.org</a>  | (703) 907-8024                     |
| ECAMA        | Electronic Components Assemblies & Materials Association<br>(See ECA)  |                                    |
| EIA          | Electronic Industries Alliance<br>(See TIA)  |                                    |
| EIMA         | EIFS Industry Members Association<br><a href="http://www.eima.com">www.eima.com</a>  | (800) 294-3462<br>(703) 538-1616   |
| EJMA         | Expansion Joint Manufacturers Association, Inc.<br><a href="http://www.ejma.org">www.ejma.org</a>  | (914) 332-0040                     |
| ESD          | ESD Association<br>(Electrostatic Discharge Association)<br><a href="http://www.esda.org">www.esda.org</a>   | (315) 339-6937                     |
| ESTA         | Entertainment Services and Technology Association<br>(See PLASA)   |                                    |
| EVO          | Efficiency Valuation Organization<br><a href="http://www.evo-world.org">www.evo-world.org</a>  | (415) 367-3643<br>44 20 88 167 857 |
| FIBA         | Fédération Internationale de Basketball<br>(The International Basketball Federation)<br><a href="http://www.fiba.com">www.fiba.com</a>             | 41 22 545 00 00                    |
| FIVB         | Fédération Internationale de Volleyball<br>(The International Volleyball Federation)<br><a href="http://www.fivb.org">www.fivb.org</a>             | 41 21 345 35 45                    |
| FM Approvals | FM Approvals LLC<br><a href="http://www.fmglobal.com">www.fmglobal.com</a>   | (781) 762-4300                     |
| FM Global    | FM Global<br>(Formerly: FMG - FM Global)<br><a href="http://www.fmglobal.com">www.fmglobal.com</a>   | (401) 275-3000                     |
| FRSA         | Florida Roofing, Sheet Metal & Air Conditioning Contractors<br>Association, Inc.<br><a href="http://www.floridarooft.com">www.floridarooft.com</a> | (407) 671-3772                     |
| FSA          | Fluid Sealing Association  | (610) 971-4850                     |

## REFERENCES

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|         |  |                                  |
|---------|--|----------------------------------|
|         | <a href="http://www.fluidsealing.com">www.fluidsealing.com</a>   |                                  |
| FSC     | Forest Stewardship Council U.S.<br><a href="http://www.fscus.org">www.fscus.org</a>                                | (612) 353-4511                   |
| GA      | Gypsum Association<br><a href="http://www.gypsum.org">www.gypsum.org</a>   | (301) 277-8686                   |
| GANA    | Glass Association of North America<br><a href="http://www.glasswebsite.com">www.glasswebsite.com</a>               | (785) 271-0208                   |
| GS      | Green Seal<br><a href="http://www.greenseal.org">www.greenseal.org</a>   | (202) 872-6400                   |
| HI      | Hydraulic Institute<br><a href="http://www.pumps.org">www.pumps.org</a>  | (973) 267-9700                   |
| HI/GAMA | Hydronics Institute/Gas Appliance Manufacturers<br>Association<br>(See AHRI)                                       |                                  |
| HMMA    | Hollow Metal Manufacturers Association<br>(See NAAMM)  |                                  |
| HPVA    | Hardwood Plywood & Veneer Association<br><a href="http://www.hpva.org">www.hpva.org</a>                            | (703) 435-2900                   |
| HPW     | H. P. White Laboratory, Inc.<br><a href="http://www.hpwhite.com">www.hpwhite.com</a>                               | (410) 838-6550                   |
| IAPSC   | International Association of Professional Security Consultants<br><a href="http://www.iapsc.org">www.iapsc.org</a> | (415) 536-0288                   |
| IAS     | International Approval Services<br>(See CSA)   |                                  |
| ICBO    | International Conference of Building Officials<br>(See ICC)  |                                  |
| ICC     | International Code Council<br><a href="http://www.iccsafe.org">www.iccsafe.org</a>                                 | (888) 422-7233<br>(202) 370-1800 |
| ICEA    | Insulated Cable Engineers Association, Inc.<br><a href="http://www.icea.net">www.icea.net</a>                      | (770) 830-0369                   |
| ICPA    | International Cast Polymer Alliance<br><a href="http://www.icpa-hq.org">www.icpa-hq.org</a>                        | (703) 525-0511                   |
| ICRI    | International Concrete Repair Institute, Inc.  | (847) 827-0830                   |

## REFERENCES

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|          |  |                                  |
|----------|--|----------------------------------|
|          | <a href="http://www.icri.org">www.icri.org</a>   |                                  |
| IEC      | International Electrotechnical Commission<br><a href="http://www.iec.ch">www.iec.ch</a>  | 41 22 919 02 11                  |
| IEEE     | Institute of Electrical and Electronics Engineers, Inc. (The)<br><a href="http://www.ieee.org">www.ieee.org</a>  | (212) 419-7900                   |
| IES      | Illuminating Engineering Society<br>(Formerly: Illuminating Engineering Society of North America)<br><a href="http://www.ies.org">www.ies.org</a>                        | (212) 248-5000                   |
| IESNA    | Illuminating Engineering Society of North America<br>(See IES)   |                                  |
| IENT     | Institute of Environmental Sciences and Technology<br><a href="http://www.ient.org">www.ient.org</a>   | (847) 981-0100                   |
| IGMA     | Insulating Glass Manufacturers Alliance<br><a href="http://www.igmaonline.org">www.igmaonline.org</a>  | (613) 233-1510                   |
| IGSHPA   | International Ground Source Heat Pump Association<br><a href="http://www.igshpa.okstate.edu">www.igshpa.okstate.edu</a>  | (405) 744-5175                   |
| ILI      | Indiana Limestone Institute of America, Inc.<br><a href="http://www.iliai.com">www.iliai.com</a>   | (812) 275-4426                   |
| Intertek | Intertek Group<br>(Formerly: ETL SEMCO; Intertek Testing Service NA)<br><a href="http://www.intertek.com">www.intertek.com</a>   | (800) 967-5352                   |
| ISA      | International Society of Automation (The)<br>(Formerly: Instrumentation, Systems, and Automation Society)<br><a href="http://www.isa.org">www.isa.org</a>                | (919) 549-8411                   |
| ISAS     | Instrumentation, Systems, and Automation Society (The)<br>(See ISA)  |                                  |
| ISFA     | International Surface Fabricators Association<br>(Formerly: International Solid Surface Fabricators Association)<br><a href="http://www.isfanow.org">www.isfanow.org</a> | (877) 464-7732<br>(801) 341-7360 |
| ISO      | International Organization for Standardization<br><a href="http://www.iso.org">www.iso.org</a>   | 41 22 749 01 11                  |
| ISSFA    | International Solid Surface Fabricators Association  |                                  |

## REFERENCES

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(See ISFA)

|       |  |                                  |
|-------|--|----------------------------------|
| ITU   | International Telecommunication Union<br>www.itu.int/home  | 41 22 730 51 11                  |
| KCMA  | Kitchen Cabinet Manufacturers Association<br>www.kcma.org  | (703) 264-1690                   |
| LMA   | Laminating Materials Association<br>(See CPA)  |                                  |
| LPI   | Lightning Protection Institute<br>www.lightning.org  | (800) 488-6864                   |
| MBMA  | Metal Building Manufacturers Association<br>www.mbma.com   | (216) 241-7333                   |
| MCA   | Metal Construction Association<br>www.metalconstruction.org  | (847) 375-4718                   |
| MFMA  | Maple Flooring Manufacturers Association, Inc.<br>www.maplefloor.org   | (888) 480-9138                   |
| MFMA  | Metal Framing Manufacturers Association, Inc.<br>www.metalframingmfg.org   | (312) 644-6610                   |
| MHIA  | Material Handling Industry of America<br>www.mhia.org  | (800) 345-1815<br>(704) 676-1190 |
| MIA   | Marble Institute of America<br>www.marble-institute.com  | (440) 250-9222                   |
| MMPA  | Moulding & Millwork Producers Association<br>(Formerly: Wood Moulding & Millwork Producers Association)<br>www.wmmpa.com | (800) 550-7889<br>(530) 661-9591 |
| MPI   | Master Painters Institute<br>www.paintinfo.com   | (888) 674-8937<br>(604) 298-7578 |
| MSS   | Manufacturers Standardization Society of The Valve and Fittings Industry Inc.<br>www.mss-hq.org                          | (703) 281-6613                   |
| NAAMM | National Association of Architectural Metal Manufacturers<br>www.naamm.org   | (630) 942-6591                   |
| NACE  | NACE International<br>(National Association of Corrosion Engineers International)  | (800) 797-6223<br>(281) 228-6200 |

## REFERENCES

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|       |   |                                  |
|-------|---|----------------------------------|
|       | www.nace.org  |                                  |
| NADCA | National Air Duct Cleaners Association<br>www.nadca.com               | (202) 737-2926                   |
| NAIMA | North American Insulation Manufacturers Association<br>www.naima.org  | (703) 684-0084                   |
| NBGQA | National Building Granite Quarries Association, Inc.<br>www.nbgqa.com | (800) 557-2848                   |
| NCAA  | National Collegiate Athletic Association (The)<br>www.ncaa.org        | (317) 917-6222                   |
| NCMA  | National Concrete Masonry Association<br>www.ncma.org                 | (703) 713-1900                   |
| NEBB  | National Environmental Balancing Bureau<br>www.nebb.org               | (301) 977-3698                   |
| NECA  | National Electrical Contractors Association<br>www.necanet.org        | (301) 657-3110                   |
| NeLMA | Northeastern Lumber Manufacturers Association<br>www.nelma.org        | (207) 829-6901                   |
| NEMA  | National Electrical Manufacturers Association<br>www.nema.org         | (703) 841-3200                   |
| NETA  | InterNational Electrical Testing Association<br>www.netaworld.org     | (888) 300-6382<br>(269) 488-6382 |
| NFHS  | National Federation of State High School Associations<br>www.nfhs.org | (317) 972-6900                   |
| NFPA  | NFPA<br>(National Fire Protection Association)<br>www.nfpa.org        | (800) 344-3555<br>(617) 770-3000 |
| NFPA  | NFPA International<br>(See NFPA)                                      |                                  |
| NFRC  | National Fenestration Rating Council<br>www.nfrc.org                  | (301) 589-1776                   |
| NHLA  | National Hardwood Lumber Association<br>www.nhla.com                  | (800) 933-0318<br>(901) 377-1818 |
| NLGA  | National Lumber Grades Authority                                      | (604) 524-2393                   |

## REFERENCES

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[www.nlga.org](http://www.nlga.org)

|       |  |                                  |
|-------|--|----------------------------------|
| NOFMA | National Oak Flooring Manufacturers Association<br>(See NWFA)  |                                  |
| NOMMA | National Ornamental & Miscellaneous Metals Association<br><a href="http://www.nomma.org">www.nomma.org</a>                           | (888) 516-8585                   |
| NRCA  | National Roofing Contractors Association<br><a href="http://www.nrca.net">www.nrca.net</a>   | (800) 323-9545<br>(847) 299-9070 |
| NRMCA | National Ready Mixed Concrete Association<br><a href="http://www.nrmca.org">www.nrmca.org</a>  | (888) 846-7622<br>(301) 587-1400 |
| NSF   | NSF International<br>(National Sanitation Foundation International)<br><a href="http://www.nsf.org">www.nsf.org</a>                  | (800) 673-6275<br>(734) 769-8010 |
| NSPE  | National Society of Professional Engineers<br><a href="http://www.nspe.org">www.nspe.org</a>   | (703) 684-2800                   |
| NSSGA | National Stone, Sand & Gravel Association<br><a href="http://www.nssga.org">www.nssga.org</a>  | (800) 342-1415<br>(703) 525-8788 |
| NTMA  | National Terrazzo & Mosaic Association, Inc. (The)<br><a href="http://www.ntma.com">www.ntma.com</a>                                 | (800) 323-9736                   |
| NWFA  | National Wood Flooring Association<br><a href="http://www.nwfa.org">www.nwfa.org</a>   | (800) 422-4556<br>(636) 519-9663 |
| PCI   | Precast/Prestressed Concrete Institute<br><a href="http://www.pci.org">www.pci.org</a>   | (312) 786-0300                   |
| PDI   | Plumbing & Drainage Institute<br><a href="http://www.pdionline.org">www.pdionline.org</a>  | (800) 589-8956<br>(978) 557-0720 |
| PLASA | PLASA<br>(Formerly: ESTA - Entertainment Services and Technology<br>Association)<br><a href="http://www.plasa.org">www.plasa.org</a> | (212) 244-1505                   |
| RCSC  | Research Council on Structural Connections<br><a href="http://www.boltcouncil.org">www.boltcouncil.org</a>                           |                                  |
| RFCI  | Resilient Floor Covering Institute<br><a href="http://www.rfci.com">www.rfci.com</a>   | (706) 882-3833                   |
| RIS   | Redwood Inspection Service<br><a href="http://www.redwoodinspection.com">www.redwoodinspection.com</a>                               | (925) 935-1499                   |

## REFERENCES

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|          |   |                                  |
|----------|---|----------------------------------|
| SAE      | SAE International<br>(Society of Automotive Engineers)<br><a href="http://www.sae.org">www.sae.org</a>                      | (877) 606-7323<br>(724) 776-4841 |
| SBCCI    | Southern Building Code Congress International, Inc.<br>(See ICC)  |                                  |
| SCTE     | Society of Cable Telecommunications Engineers<br><a href="http://www.scte.org">www.scte.org</a>                             | (800) 542-5040<br>(610) 363-6888 |
| SDI      | Steel Deck Institute<br><a href="http://www.sdi.org">www.sdi.org</a>  | (847) 458-4647                   |
| SDI      | Steel Door Institute<br><a href="http://www.steeldoor.org">www.steeldoor.org</a>  | (440) 899-0010                   |
| SEFA     | Scientific Equipment and Furniture Association<br><a href="http://www.sefalabs.com">www.sefalabs.com</a>                    | (877) 294-5424<br>(516) 294-5424 |
| SEI/ASCE | Structural Engineering Institute/American Society of Civil<br>Engineers<br>(See ASCE)                                       |                                  |
| SIA      | Security Industry Association<br><a href="http://www.siaonline.org">www.siaonline.org</a>                                   | (866) 817-8888<br>(703) 683-2075 |
| SJI      | Steel Joist Institute<br><a href="http://www.steeljoist.org">www.steeljoist.org</a>   | (843) 293-1995                   |
| SMA      | Screen Manufacturers Association<br><a href="http://www.smainfo.org">www.smainfo.org</a>                                    | (773) 636-0672                   |
| SMACNA   | Sheet Metal and Air Conditioning Contractors' National<br>Association<br><a href="http://www.smacna.org">www.smacna.org</a> | (703) 803-2980                   |
| SMPTE    | Society of Motion Picture and Television Engineers<br><a href="http://www.smpte.org">www.smpte.org</a>                      | (914) 761-1100                   |
| SPFA     | Spray Polyurethane Foam Alliance<br><a href="http://www.sprayfoam.org">www.sprayfoam.org</a>                                | (800) 523-6154                   |
| SPIB     | Southern Pine Inspection Bureau<br><a href="http://www.spib.org">www.spib.org</a>   | (850) 434-2611                   |
| SPRI     | Single Ply Roofing Industry<br><a href="http://www.spri.org">www.spri.org</a>   | (781) 647-7026                   |

|         |  |                                  |
|---------|--|----------------------------------|
| SRCC    | Solar Rating and Certification Corporation<br><a href="http://www.solar-rating.org">www.solar-rating.org</a>   | (321) 638-1537                   |
| SSINA   | Specialty Steel Industry of North America<br><a href="http://www.ssina.com">www.ssina.com</a>  | (800) 982-0355<br>(202) 342-8630 |
| SSPC    | SSPC: The Society for Protective Coatings<br><a href="http://www.sspc.org">www.sspc.org</a>  | (877) 281-7772<br>(412) 281-2331 |
| STI     | Steel Tank Institute<br><a href="http://www.steeltank.com">www.steeltank.com</a>   | (847) 438-8265                   |
| SWI     | Steel Window Institute<br><a href="http://www.steelwindows.com">www.steelwindows.com</a>   | (216) 241-7333                   |
| SWPA    | Submersible Wastewater Pump Association<br><a href="http://www.swpa.org">www.swpa.org</a>  | (847) 681-1868                   |
| TCA     | Tilt-Up Concrete Association<br><a href="http://www.tilt-up.org">www.tilt-up.org</a>   | (319) 895-6911                   |
| TCNA    | Tile Council of North America, Inc.<br>(Formerly: Tile Council of America)<br><a href="http://www.tileusa.com">www.tileusa.com</a>   | (864) 646-8453                   |
| TEMA    | Tubular Exchanger Manufacturers Association, Inc.<br><a href="http://www.tema.org">www.tema.org</a>  | (914) 332-0040                   |
| TIA     | Telecommunications Industry Association<br>(Formerly: TIA/EIA - Telecommunications Industry<br>Association/Electronic Industries Alliance)<br><a href="http://www.tiaonline.org">www.tiaonline.org</a> | (703) 907-7700                   |
| TIA/EIA | Telecommunications Industry Association/Electronic<br>Industries Alliance<br>(See TIA)   |                                  |
| TMS     | The Masonry Society<br><a href="http://www.masonrysociety.org">www.masonrysociety.org</a>  | (303) 939-9700                   |
| TPI     | Truss Plate Institute<br><a href="http://www.tpinst.org">www.tpinst.org</a>  | (703) 683-1010                   |
| TPI     | Turfgrass Producers International<br><a href="http://www.turfgrasssod.org">www.turfgrasssod.org</a>  | (800) 405-8873<br>(847) 649-5555 |
| TRI     | Tile Roofing Institute<br><a href="http://www.tilerroofing.org">www.tilerroofing.org</a>   | (312) 670-4177                   |



|        |  |                                  |
|--------|--|----------------------------------|
| UBC    | Uniform Building Code<br>(See ICC)   |                                  |
| UL     | Underwriters Laboratories Inc.<br>www.ul.com   | (877) 854-3577                   |
| UNI    | Uni-Bell PVC Pipe Association<br>www.uni-bell.org  | (972) 243-3902                   |
| USAV   | USA Volleyball<br>www.usavolleyball.org  | (888) 786-5539<br>(719) 228-6800 |
| USGBC  | U.S. Green Building Council<br>www.usgbc.org   | (800) 795-1747                   |
| USITT  | United States Institute for Theatre Technology, Inc.<br>www.usitt.org                      | (800) 938-7488<br>(315) 463-6463 |
| WASTEC | Waste Equipment Technology Association<br>www.wastec.org                                   | (800) 424-2869<br>(202) 244-4700 |
| WCLIB  | West Coast Lumber Inspection Bureau<br>www.wclib.org                                       | (800) 283-1486<br>(503) 639-0651 |
| WCMA   | Window Covering Manufacturers Association<br>www.wcmanet.org                               | (212) 297-2122                   |
| WDMA   | Window & Door Manufacturers Association<br>www.wdma.com                                    | (800) 223-2301<br>(312) 321-6802 |
| WI     | Woodwork Institute<br>(Formerly: WIC - Woodwork Institute of California)<br>www.wicnet.org | (916) 372-9943                   |
| WMPA   | Wood Moulding & Millwork Producers Association<br>(See MMPA)                               |                                  |
| WSRCA  | Western States Roofing Contractors Association<br>www.wsrca.com                            | (800) 725-0333<br>(650) 938-5441 |
| WWPA   | Western Wood Products Association<br>www.wwpa.org  | (503) 224-3930                   |

- C. Code Agencies: 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 sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

|        |   |                                  |
|--------|---|----------------------------------|
| DIN    | Deutsches Institut für Normung e.V.<br>www.din.de                               | 49 30 2601-0                     |
| IAPMO  | International Association of Plumbing and Mechanical Officials<br>www.iapmo.org | (909) 472-4100                   |
| ICC    | International Code Council<br>www.iccsafe.org                                   | (888) 422-7233                   |
| ICC-ES | ICC Evaluation Service, LLC<br>www.icc-es.org                                   | (800) 423-6587<br>(562) 699-0543 |

- D. Federal Government Agencies: 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 sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

|      |  |                                  |
|------|--|----------------------------------|
| COE  | Army Corps of Engineers<br>www.usace.army.mil  | (202) 761-0011                   |
| CPSC | Consumer Product Safety Commission<br>www.cpsc.gov                                       | (800) 638-2772<br>(301) 504-7923 |
| DOC  | Department of Commerce<br>National Institute of Standards and Technology<br>www.nist.gov | (301) 975-4040                   |
| DOD  | Department of Defense<br>http://dodssp.daps.dla.mil                                      | (215) 697-2664                   |
| DOE  | Department of Energy<br>www.energy.gov   | (202) 586-9220                   |
| EPA  | Environmental Protection Agency<br>www.epa.gov   | (202) 272-0167                   |
| FAA  | Federal Aviation Administration<br>www.faa.gov   | (866) 835-5322                   |
| FG   | Federal Government Publications<br>www.gpo.gov   | (202) 512-1800                   |
| GSA  | General Services Administration<br>www.gsa.gov   | (800) 488-3111<br>(202) 619-8925 |
| HUD  | Department of Housing and Urban Development<br>www.hud.gov                               | (202) 708-1112                   |

|      |  |                                  |
|------|--|----------------------------------|
| LBL  | Lawrence Berkeley National Laboratory<br>Environmental Energy Technologies Division<br><a href="http://eetd.lbl.gov">http://eetd.lbl.gov</a>     | (510) 486-4000                   |
| OSHA | Occupational Safety & Health Administration<br><a href="http://www.osha.gov">www.osha.gov</a>  | (800) 321-6742                   |
| SD   | Department of State<br><a href="http://www.state.gov">www.state.gov</a>  | (202) 647-4000                   |
| TRB  | Transportation Research Board<br>National Cooperative Highway Research Program<br><a href="http://www.trb.org">www.trb.org</a>                   | (202) 334-2934                   |
| USDA | Department of Agriculture<br>Agriculture Research Service<br>U.S. Salinity Laboratory<br><a href="http://www.ars.usda.gov">www.ars.usda.gov</a>  | (202) 720-3656                   |
| USDA | Department of Agriculture<br>Rural Utilities Service<br><a href="http://www.usda.gov">www.usda.gov</a>   | (202) 720-2791                   |
| USDJ | Department of Justice<br>Office of Justice Programs<br>National Institute of Justice<br><a href="http://www.ojp.usdoj.gov">www.ojp.usdoj.gov</a> | (202) 307-0703                   |
| USP  | U.S. Pharmacopeia<br><a href="http://www.usp.org">www.usp.org</a>  | (800) 227-8772<br>(301) 881-0666 |
| USPS | United States Postal Service<br><a href="http://www.usps.com">www.usps.com</a>   | (202) 268-2000                   |

- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

|     |  |                                  |
|-----|--|----------------------------------|
| CFR | Code of Federal Regulations<br>Available from Government Printing Office<br><a href="http://www.gpo.gov/fdsys">www.gpo.gov/fdsys</a>   | (866) 512-1800<br>(202) 512-1800 |
| DOD | Department of Defense<br>Military Specifications and Standards<br>Available from Department of Defense Single Stock Point<br><a href="http://dodssp.daps.dla.mil">http://dodssp.daps.dla.mil</a> | (215) 697-2664                   |

|             |  |  |
|-------------|--|--|
| DSCC        | Defense Supply Center Columbus<br>(See FS)   |  |
| FED-STD     | Federal Standard<br>(See FS)   |  |
| FS          | Federal Specification<br>Available from Department of Defense Single Stock Point<br><a href="http://dodssp.daps.dla.mil">http://dodssp.daps.dla.mil</a><br><br>Available from Defense Standardization Program<br><a href="http://www.dsp.dla.mil">www.dsp.dla.mil</a><br><br>Available from General Services Administration<br><a href="http://www.gsa.gov">www.gsa.gov</a><br><br>Available from National Institute of Building Sciences/Whole<br>Building Design Guide<br><a href="http://www.wbdg.org/ccb">www.wbdg.org/ccb</a> | (215) 697-2664<br><br><br><br><br><br><br><br><br><br><br>(800) 488-3111<br>(202) 619-8925<br><br>(202) 289-7800 |
| MILSPEC     | Military Specification and Standards<br>(See DOD)  |  |
| USAB        | United States Access Board<br><a href="http://www.access-board.gov">www.access-board.gov</a>   | (800) 872-2253<br>(202) 272-0080   |
| USATBC<br>B | U.S. Architectural & Transportation Barriers Compliance Board<br><br>(See USAB)  |  |

- F. State Government Agencies: 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 sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

|      |  |                                  |
|------|--|----------------------------------|
| CBHF | State of California<br>Department of Consumer Affairs<br>Bureau of Electronic Appliance and Repair, Home Furnishings and<br>Thermal Insulation<br><a href="http://www.bearhfti.ca.gov">www.bearhfti.ca.gov</a> | (800) 952-5210<br>(916) 574-2041 |
| CCR  | California Code of Regulations<br>Office of Administrative Law<br>California Title 24 Energy Code<br><a href="http://www.calregs.com">www.calregs.com</a>  | (916) 323-6225                   |
| CDHS | California Department of Health Care Services  |                                  |

(Formerly: California Department of Health Services)  
(See CCR)

CDPH California Department of Public Health  
Indoor Air Quality Program  
[www.cal-iaq.org](http://www.cal-iaq.org)

CPUC California Public Utilities Commission  
[www.cpuc.ca.gov](http://www.cpuc.ca.gov)

(800) 848-5580  
(415) 703-2782

SCAQM South Coast Air Quality Management District  
D [www.aqmd.gov](http://www.aqmd.gov)

(909) 396-2000

TFS Texas Forest Service  
Forest Resource Development and Sustainable Forestry  
<http://txforests-service.tamu.edu>

(979) 458-6606

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200



## SECTION 016000 - PRODUCT REQUIREMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
  - 1. Section 012500 "Substitution Procedures" for requests for substitutions.
  - 2. Section 014200 "References" for applicable industry standards for products specified.

#### 1.3 DEFINITIONS

- A. Products: Items obtained 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. Products salvaged or recycled from other projects are not considered new products.
  - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," 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 comparable products of additional manufacturers named in the specification.

#### 1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
  - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
  - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor through Construction Manager of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
    - a. Form of Approval: As specified in Section 012500 "Substitution Procedures."
    - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

#### 1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
  - 1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
  - 2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

#### 1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
  - 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 determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

## 1.7 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.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
  2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
  3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 017700 "Closeout Procedures."

## PART 2 - PRODUCTS

### 2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, 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. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
  6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
  3. Products:
    - a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
    - b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product.
  4. Manufacturers:
    - a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

- b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" Article for consideration of an unnamed manufacturer's product.
- 5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
  - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
  - 1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
  - 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
  - 3. Evidence that proposed product provides specified warranty.
  - 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
  - 5. Samples, if requested.

LEE'S SUMMIT MIDDLE SCHOOL #4  
PACKAGE 3 – BUILDING & SITE  
LEE'S SUMMIT, MISSOURI

13-20102-00  
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PERMIT SET

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

PRODUCT REQUIREMENTS

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## SECTION 017300 - EXECUTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 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. General installation of products.
  - 2. Construction layout.
  - 3. Field engineering and surveying.
  - 4. General installation of products.
  - 5. Coordination of Owner-installed products.
  - 6. Progress cleaning.
  - 7. Starting and adjusting.
  - 8. Protection of installed construction.
  - 9. Correction of the Work.
- B. Related Sections include the following:
  - 1. Section 013100 "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
  - 2. Section 013300 "Submittal Procedures" for submitting surveys.
  - 3. Section 017329 "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
  - 4. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

### 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. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
  - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
  - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. 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. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
    - a. Description of the Work.
    - b. List of detrimental conditions, including substrates.
    - c. List of unacceptable installation tolerances.
    - d. Recommended corrections.
  - 2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
  - 3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
  - 4. Examine roofs for suitable conditions where products and systems are to be installed.
  - 5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.2 PREPARATION

- A. 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

## EXECUTION

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fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

- B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- C. 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.

### 3.3 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.
- 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. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. 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. Allow for building movement, including thermal expansion and contraction.
  - 2. Coordinate installation of anchorages. 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. Deliver such items to Project site in time for installation.
- H. 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.

### EXECUTION

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- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

### 3.4 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.

### 3.5 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 (27 deg C).
  - 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.
- 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. 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.



- F. 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.
- G. 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.
- H. 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.

### 3.6 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 Section 014000 "Quality Requirements."

### 3.7 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.

### 3.8 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Section 017329 "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 017300

## SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

### 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. This Section includes administrative and procedural requirements for the following:
  - 1. Disposing of nonhazardous demolition and construction waste.

#### 1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

### PART 2 - PRODUCTS (Not Used)

### PART 3 - EXECUTION

#### 3.1 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
  - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 017419

## SECTION 017700 - CLOSEOUT PROCEDURES

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 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. Warranties.
  - 3. Final cleaning.
- B. Related Sections include the following:
  - 1. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
  - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 3. Section 017900 "Demonstration and Training" for requirements for instructing Owner's personnel.
  - 4. Divisions 02 through 49 Sections for specific closeout and special cleaning requirements for the Work in 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, Final Completion construction photographs, 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. Submit test/adjust/balance records.
  10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
  11. Advise Owner of changeover in heat and other utilities.
  12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
  13. Complete final cleaning requirements, including touchup painting.
  14. 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, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection 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 01 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. Submit pest-control final inspection report and warranty.
  5. 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 and Construction Manager 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. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

## 1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit copy of list to Architect for review. 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.
  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.
  3. Include the following information at the top of each page:
    - a. Project name.
    - b. Date.
    - c. Name of Architect.
    - d. Name of Contractor.
    - e. Page number.

## 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. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. 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 (215-by-280-mm) 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.
  4. Provide CD with electronic files of all warranties in PDF format, indexed and organized same as warranty binder in an orderly manner acceptable to the Owner.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals as instructed by Architect or Owner.

## 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. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    - e. Remove snow and ice to provide safe access to building.
    - f. 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.

## CLOSEOUT PROCEDURES

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- g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
  - h. Sweep concrete floors broom clean in unoccupied spaces.
  - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
  - j. 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.
  - k. Remove labels that are not permanent.
  - l. 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.
  - m. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
  - n. Replace parts subject to unusual operating conditions.
  - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
  - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
  - q. Clean ducts, blowers, and coils if units were operated without filters during construction.
  - r. 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.
  - s. Leave Project clean and ready for occupancy.
- C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.
- D. 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.

END OF SECTION 017700



## SECTION 017823 - 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 other Division 01 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. Operation and maintenance documentation directory.
  - 2. Emergency manuals.
  - 3. Operation manuals for systems, subsystems, and equipment.
  - 4. Maintenance manuals for the care and maintenance of products, materials, finishes, systems, and equipment.
- B. Related Sections include the following:
  - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
  - 2. Section 017700 "Closeout Procedures" for submitting operation and maintenance manuals.
  - 3. Section 017839 "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
  - 4. Divisions 02 through 49 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

#### 1.3 SUBMITTALS

- A. Initial Submittal: Submit 1 draft copy of each manual at least 15 days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return one copy of draft and mark whether general scope and content of manual are acceptable.
  - 1. Submit CD of electronic files of each document included in the Operation and Maintenance Manual, indexed and ordered same as Operations and Maintenance Manual.
- B. Final Submittal: Submit one 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 1 copy of each corrected manual within 15 days of receipt of Architect's comments.
2. Submit CD of electronic files of each document included in the Operation and Maintenance Manuals, indexed and ordered same as Operations and Maintenance Manual, organized in an orderly manner acceptable to the Owner.

#### 1.4 COORDINATION

- A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

### PART 2 - PRODUCTS

#### 2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Organization: Include a section in the directory for each of the following:
  1. List of documents.
  2. List of systems.
  3. List of equipment.
  4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

#### 2.2 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 the following materials, in the order listed:
  1. Title page.

2. Table of contents.
  3. 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 the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- 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 (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
    - b. 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. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
  5. 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.

## 2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
  1. System, subsystem, and equipment descriptions.
  2. Performance and design criteria if Contractor is delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
  5. Operating logs.
  6. Wiring diagrams.
  7. Control diagrams.
  8. Piped system diagrams.
  9. Precautions against improper use.
  10. License requirements including inspection and renewal dates.
- 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 and tests.
  9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
  1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the 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 and the following:
  - 1. Inspection procedures.
  - 2. Types of cleaning agents to be used and methods of cleaning.
  - 3. List of cleaning agents and methods of cleaning detrimental to product.
  - 4. Schedule for routine cleaning and maintenance.
  - 5. 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.
  - 1. Include procedures to follow and required notifications for warranty claims.

## 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 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 the following information for each component part or piece of equipment:
1. Standard printed maintenance instructions and bulletins.
  2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  3. Identification and nomenclature of parts and components.
  4. List of items recommended to be stocked as spare parts.
- D. **Maintenance Procedures:** Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
  2. Troubleshooting guide.
  3. Precautions against improper maintenance.
  4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  5. Aligning, adjusting, and checking instructions.
  6. Demonstration and training videotape, if available.
- 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.
1. **Scheduled Maintenance and Service:** Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
  2. **Maintenance and Service Record:** Include manufacturers' forms for recording maintenance.
- 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.
1. Include procedures to follow and required notifications for warranty claims.



## PART 3 - EXECUTION

### 3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. 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.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. 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.
  - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
  - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. 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 a 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.
  - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the 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.
  - 2. Comply with requirements of newly prepared Record Drawings in Section 017839 "Project Record Documents."
- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

OPERATION AND MAINTENANCE DATA

017823 - 7



## SECTION 017839 - PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 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. Related Sections include the following:
  - 1. Section 017700 "Closeout Procedures" for general closeout procedures.
  - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
  - 3. Divisions 02 through 49 Sections for specific requirements for Project Record Documents of the Work in those Sections.

#### 1.3 SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit one set(s) of marked-up Record Prints.
  - 2. Submit CD with electronic files in PDF format of all record drawings organized as stated herein and as acceptable to the Owner.
- B. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications.
  - 1. Submit CD with electronic files in PDF format of all Project specifications, including addenda and contract modifications organized as stated herein and as acceptable to the Owner.
- C. Record Product Data: Submit one copy of each Product Data submittal.

1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.
2. Submit CD with electronic files in PDF format of all Record Product Data organized as stated herein and as acceptable to the Owner.

## 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 the 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. Accurately record information in an understandable drawing technique.
    - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
  2. Content: Types of items requiring marking include, but are not limited to, the following:
    - a. Dimensional changes to Drawings.
    - b. Revisions to details shown on Drawings.
    - c. Depths of foundations below first floor.
    - d. Locations and depths of underground utilities.
    - e. Revisions to routing of piping and conduits.
    - f. Revisions to electrical circuitry.
    - g. Actual equipment locations.
    - h. Duct size and routing.
    - i. Locations of concealed internal utilities.
    - j. Changes made by Change Order or Construction Change Directive.
    - k. Changes made following Architect's written orders.
    - l. Details not on the original Contract Drawings.
    - m. Field records for variable and concealed conditions.
    - n. Record information on the Work that is shown only schematically.
  3. 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.
  4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

5. Mark important additional information that was either shown schematically or omitted from original Drawings.
  6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Transparencies: Immediately before inspection for Certificate of Substantial Completion, review marked-up Record Prints with Architect. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.
1. Incorporate changes and additional information previously marked on Record Prints. Erase, redraw, and add details and notations where applicable.
  2. Refer instances of uncertainty to Architect for resolution.
  3. Owner will furnish Contractor one set of transparencies of the Contract Drawings for use in recording information.
  4. Print the Contract Drawings and Shop Drawings for use as Record Transparencies. Architect will make the Contract Drawings available to Contractor's print shop.
- C. 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. Record Transparencies: Organize into unbound sets matching Record Prints. Place transparencies in durable tube-type drawing containers with end caps. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
  3. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect.
    - e. Name of Contractor.

## 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 the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.

5. Note related Change Orders, Record Product Data, and Record Drawings 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 Specifications, and Record Drawings where applicable.

## 2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

# PART 3 - EXECUTION

## 3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the 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 a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

END OF SECTION 017839

SECTION 033000 - CAST-IN-PLACE CONCRETE – FOR REFERENCE

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. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
  - 1. Footings.
  - 2. Slabs-on-grade.
  - 3. Walls.
  - 4. Slabs on metal decks.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with fly ash; subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures each with its own identification number when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Indicate the minimum following information:
  - 1. Mix Identification Number.
  - 2. Mix-use type.
  - 3. Required 28-day compressive strength.
  - 4. Cement content.
  - 5. Coarse aggregate type and quantity.
  - 6. Fine aggregate type and quantity.
  - 7. Total aggregate gradation.
  - 8. Water quantity.

9. Admixture types and quantity.
  10. Slump measurement.
  11. Air content.
  12. 28-day shrinkage rate.
  13. 28-day concrete strength test.
  14. Alkali Silicate Reactivity (ASR).
  15. Chloride-ion content.
  16. Amounts of mixing water to be withheld for later addition at Project site.
- D. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- E. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, licensed in the state which the project is located, detailing fabrication, assembly, and support of formwork.
- F. Concrete Slab Plans:
1. Indicate all construction, contraction, control and expansion joints, as well as proposed start and stop of concrete pour joints.
  2. Indicate all sloped slab areas at floor drains. Label depth of floor drain and shape/ extent of sloped area surrounding drain.
  3. Indicate all slab recess areas. Dimension extents in plan, and depth of recess.
- G. Welding certificates.
- H. Qualification Data: For manufacturer and testing agency.
- I. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- J. Material Certificates: For each of the following, signed by manufacturers:
1. Cementitious materials.
  2. Admixtures.
  3. Form materials and form-release agents.
  4. Steel reinforcement and accessories.
  5. Waterstops.
  6. Curing compounds.
  7. Bonding agents.
  8. Adhesives.
  9. Vapor retarders.
  10. Semi-rigid joint filler.
  11. Joint-filler strips.



12. Repair materials.

- K. Floor surface flatness and levelness measurements to determine compliance with specified tolerances.
- L. Field quality-control test reports.
- M. Minutes of preinstallation conference.

#### 1.5 QUALITY ASSURANCE

- A. Installer of concrete topping slabs indicated to receive polished concrete finish and structural cast-in-place concrete slab shall be the same as installer for polished concrete finishes.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
  - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
  - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. Moisture Vapor Reduction Admixture Testing Agent Qualifications:
  - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- E. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.
- F. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."
- G. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - 1. ACI 301, "Specification for Structural Concrete," Sections 1 through 5."

2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
  - H. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
  - I. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Sections.
    1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
      - a. Contractor's superintendent.
      - b. Independent testing agency responsible for concrete design mixtures.
      - c. Ready-mix concrete manufacturer.
      - d. Concrete subcontractor.
      - e. Architect.
    2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, anchor rod and anchorage device installation tolerances, steel reinforcement installation, concrete repair procedures, and concrete protection.
  - J. Protection: No satisfactory chemical or cleaning procedure is available to remove petroleum stains from the concrete surface. Prevention is therefore essential. Protect areas to receive a sealed concrete finish during construction to prevent oils, dirt, metal, excessive water and other damaging materials from affecting the finished concrete surface. Protection measures listed below shall begin immediately after the concrete slab is poured:
    1. Hydraulic powered equipment shall be diapered to avoid staining of the concrete.
    2. Vehicle parking shall be prohibited on the finish slab area. If necessary to complete their scope of work, drop cloths shall be placed under vehicles at all times.
    3. No pipe cutting machine shall be used on the finish floor slab.
    4. Steel shall not be placed on the finish slab to avoid rusting.
    5. Acids and acidic detergents will not come in contact with slab.
    6. All equipment used on the finish slab shall be equipped with non-marking tires.
    7. Painters shall use drop cloths on the concrete. Remove paint stains immediately.
    8. Construction trades shall be informed that the slab must be protected at all times.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
  - B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

## 1.7 WARRANTY

### A. Moisture Vapor Reduction Admixture (MVRA):

1. MVRA must be installed according to, and in compliance with, the manufacturer's published data sheet to include, but not limited to:
  - a. Dosing instructions.
  - b. Onsite representation requirements.
  - c. Use of an ASTM E 1745 vapor retarder installed following ASTM E 1643 and ASTM F710 guidelines; slabs on deck do not require a vapor retarder.
2. Manufacturer's Warranty: To include:
  - a. Term: Life of the concrete.
  - b. Repair and/or removal of failed flooring or roofing.
  - c. Placement of a topical moisture remediation system.
  - d. Replacement of flooring/roofing materials like original installed to include material and labor.
3. Adhesion Warranty: MVRA Manufacturer shall provide an adhesion warranty to match the term of the adhesive and/or primer manufacturer's material defect warranty upon MVRA manufacturer's acceptance of field bond test.

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

### 2.2 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301.
  2. ACI 117.

## 2.3 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.
  - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
    - a. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Pedestals and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- E. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- F. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
  - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- G. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
  - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
  - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

## 2.4 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Plain-Steel Wire: ASTM A 82, as drawn.

- D. Plain-Steel Welded Wire Reinforcement: ASTM A 185, plain, fabricated from as-drawn steel wire into flat sheets.

## 2.5 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), plain-steel bars, cut bars true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete.
  - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

## 2.6 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - 1. Portland Cement: ASTM C 150, Type I/II, gray Supplement with the following at contractor's option for concrete other than slabs and flatwork:
    - a. Fly Ash: ASTM C 618, Class C.
- B. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials. Coarse aggregate shall be from a source and ledge approved by Missouri Department of Transportation.
  - 1. Maximum Coarse-Aggregate Size: As indicated.
  - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.

## 2.7 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  2. Retarding Admixture: ASTM C 494/C 494M, Type B.
  3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- C. Moisture Vapor Reduction Admixture: For use in all interior slabs on ground and elevated floor slabs on metal deck.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Barrier One Incorporated; High Performance Concrete Admixture or comparable product by one of the following:
    - a. Concure Systems; High Performance Concrete Admixture.
    - b. ISE Logik Industries; MVRA 900 Admixture.
    - c. Moxie; Shield 1800 Admixture.
    - d. The Specialty Products Group; Vapor Lock 20/20.
    - e. Failure to provide a product that meets or exceeds the MVRA warranty requirements of Part 1 and the MVRA field quality control requirements of Part 3 will result in all subsequent testing and slab remediation costs being born by the ready mix supplier.
  2. Description: Concrete moisture vapor reduction admixture for all interior slabs on ground and elevated floor slabs on metal deck shall be a non-toxic liquid admixture specifically designed to have a natural chemical reaction with pre-existing elements inside the concrete to eliminate the route of moisture vapor emission through the slab by restricting the integral capillary system. Chemical reaction shall form a permanent barrier (capillary break) that is integral to the concrete, insoluble, and irremovable.

## 2.8 WATERSTOPS

- A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Colloid Environmental Technologies Company; Volclay Waterstop-RX.
    - b. Concrete Sealants Inc.; Conseal CS-231.
    - c. Greenstreak; Swellstop.
    - d. Henry Company, Sealants Division; Hydro-Flex.
    - e. JP Specialties, Inc.; Earthshield Type 20.
    - f. Progress Unlimited, Inc.; Superstop.
    - g. TCMiraDRI; Mirastop.

## 2.9 VAPOR RETARDERS

- A. Plastic Vapor Retarder: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Fortifiber Corporation; Moistop Ultra, 15 mils.
    - b. Insulation Solutions, Inc.: Viper Vaporcheck, 16 mils.
    - c. Raven Industries Inc.; Vapor Block, 15 mils.
    - d. Stego Industries, LLC; Stego Wrap, 15 mils.
- B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve placed below the vapor retarder.
1. Install and compact at 4 inches minimum depth, unless otherwise indicated on the Drawings.

## 2.10 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Axim Concrete Technologies; Cimfilm.
    - b. Burke by Edoco; BurkeFilm.
    - c. ChemMasters; Spray-Film.
    - d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; Aquafilm.
    - e. Dayton Superior Corporation; Sure Film.
    - f. Euclid Chemical Company (The); Eucobar.
    - g. Kaufman Products, Inc.; Vapor Aid.
    - h. Lambert Corporation; Lambco Skin.
    - i. L&M Construction Chemicals, Inc.; E-Con.
    - j. MBT Protection and Repair, Div. of ChemRex; Confilm.
    - k. Meadows, W. R., Inc.; Sealtight Evapre.
    - l. Metalcrete Industries; Waterhold.
    - m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
    - n. Sika Corporation, Inc.; SikaFilm.
    - o. Spec Chem; Spec Film RTU.
    - p. Symons Corporation, a Dayton Superior Company; Finishing Aid.
    - q. Unitex; Pro-Film.
    - r. US Mix Products Company; US Spec Monofilm ER.
    - s. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

- C. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
1. Products: Subject to compliance with requirements, provide one of the following:
- a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
  - b. Burke by Edoco; Aqua Resin Cure.
  - c. ChemMasters; Safe-Cure Clear.
  - d. Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company; W.B. Resin Cure.
  - e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
  - f. Euclid Chemical Company (The); Kurez DR VOX.
  - g. Kaufman Products, Inc.; Thinfilm 420.
  - h. Lambert Corporation; Aqua Kure-Clear.
  - i. L&M Construction Chemicals, Inc.; L&M Cure R.
  - j. Meadows, W. R., Inc.; 1100 Clear.
  - k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
  - l. Spec Chem; Spec REZ.
  - m. Symons Corporation, a Dayton Superior Company; Resi-Chem Clear Cure.
  - n. Tamms Industries, Inc.; Horncure WB 30.
  - o. Unitex; Hydro Cure 309.
  - p. US Mix Products Company; US Spec Maxcure Resin Clear.
  - q. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.

## 2.11 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1752, cork or self-expanding cork.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- D. Reglets: Fabricate reglets of not less than 0.0217-inch- (0.55-mm-) thick, galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

## 2.12 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.



1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
  2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
  3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
  4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
  2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
  3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
  4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested according to ASTM C 109/C 109M.

## 2.13 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 15 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.3 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
  2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
  3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

## 2.14 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Proportion normal-weight concrete mixtures to equal or exceed the minimum 28 day concrete compressive strength and other specified criteria indicated on the drawings.
- B. Slabs-on-grade and elevated floor slabs-on-metal deck: Comply with Paragraph 2.16.A and as follows:
  - 1. Moisture Vapor Reduction Admixture: Dose at 14 ounces per 100 pounds of total cementitious materials. Remove an equal amount of water from the mix. Add separately from other admixtures at the tail end of the load.

## 2.15 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## 2.16 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and furnish batch ticket information.
  - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

## 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 structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
  - 1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
  - 2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. 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.

## CAST-IN-PLACE CONCRETE – FOR REFERENCE

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1. Install keyways, reglets, recesses, and the like, for easy removal.
  2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
  2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

### 3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, if concrete is hard enough to not be damaged by form-removal operations and curing and protection operations are maintained.
1. Leave formwork for structural elements that supports weight of concrete in place until concrete has achieved at least 75 percent of its 28-day design compressive strength.

2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

### 3.4 VAPOR RETARDERS

- A. Plastic Vapor Retarders: Place, protect, and repair vapor retarders according to ASTM E 1643 and manufacturer's written instructions.
  1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.
  2. Seal around all penetrations with manufacturer's recommended tape.

### 3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
  1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- 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.
  1. Weld reinforcing bars according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset
- F. laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

### 3.6 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  2. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  3. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  4. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
  5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
  2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
  3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

### 3.7 WATERSTOPS

- A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

### 3.8 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. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 and if specifically approved by the Architect.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal 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 indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Maintain reinforcement in position on chairs during concrete placement.
  - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  - 4. Slope surfaces uniformly to drains where required.
  - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
  2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
  3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
  2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

### 3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to public view such as mechanical rooms and storage rooms where cast-in-place concrete walls occur.
- 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 defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces exposed to public view.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

### 3.10 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch (6 mm) in 1 direction.
1. Apply scratch finish to surfaces to receive concrete floor toppings.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces to receive trowel finish.
- D. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
  2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
    - a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade with carpet, ceramic tile, sheet flooring, vinyl tile and other thin flooring materials, and at areas with no floor covering.
    - b. Specified overall values of flatness, F(F) 50; and of levelness, F(L) 40; with minimum local values of flatness, F(F) 40; and of levelness, F(L) 35; for gymnasiums.
    - c. Specified overall values of flatness, F(F) 35; with minimum local values of flatness, F(F) 20; for elevated slabs and toppings.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces indicated where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.



### 3.11 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.
  - 1. Construct concrete bases 4 inches ((100 mm)) high unless otherwise indicated; and extend base not less than 6 inches (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

### 3.12 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less

than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

- a. Cure concrete surfaces to receive floor coverings with a moisture-retaining cover.
2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
    - a. After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

### 3.13 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
- B. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- C. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- D. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

### 3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete, but not less than 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
  3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
  2. After concrete has cured at least 14 days, correct high areas by grinding.
  3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
  4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
  5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
  6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
  7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

### 3.15 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner shall engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Inspections:
  - 1. Steel reinforcement placement.
  - 2. Steel reinforcement welding.
  - 3. Headed bolts and studs.
  - 4. Verification of use of required design mixture.
  - 5. Concrete placement, including conveying and depositing.
  - 6. Curing procedures and maintenance of curing temperature.
  - 7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
  - 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
    - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
    - b. Either 6-inch diameter by 12-inch cylinders or 4-inch diameter by 8-inch cylinders are acceptable.
    - c. Cylinder diameter shall be at least three times the nominal maximum coarse aggregate size if the mix being tested.
    - d. All cylinders of a class of concrete shall be the same size.
  - 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
  - 3. Air Content: ASTM C 231, pressure method at point of placement, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  - 4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
  - 5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  - 6. Compression Test Specimens: ASTM C 31/C 31M.
    - a. A set of test cylinders shall consist of a minimum of four standard cylinder specimens for each composite sample. The number per set may be greater depending on the cylinder sizes.

7. Compressive-Strength Tests: ASTM C 39/C 39M; test one cylinder of the laboratory-cured specimens at 7 days and one set of at least two cylinders at 28 days.
  - a. Test one cylinder of a set at 7 days and one set of two 6" by 12" cylinders or three 4" by 8" cylinders at 28 days.
  - b. One cylinder shall be retained in reserve to be tested as directed by the Engineer.
  - c. A compressive-strength test shall be the average compressive strength from a set of at least two cylinders obtained from the same composite sample and tested at age indicated.
8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa). Maintenance of test data records required for evaluation and acceptance of concrete strengths per ACI 318 shall be by the Contractor.
9. When the aforementioned acceptance criteria are not met the Contractor shall evaluate operations and steps shall be taken to increase the average of subsequent strength test results.
10. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate does not comply with the Contract Documents.

D. Testing of Slabs Containing MVRA:

1. The moisture vapor reduction admixture (MVRA) manufacturer will perform all moisture testing in accordance with this specification and will issue project specific warranties prior to installation of any slab finishes; no further field slab moisture nor pH testing shall be required.
  - a. Failure to provide a product that meets or exceeds these requirements will result in all subsequent testing and slab remediation costs being borne by the contractor.

2. A representative or agent of the moisture vapor reduction admixture (MVRA) manufacturer must be present at the jobsite during placement of all MVRA treated concrete. Do not proceed without this representative being present.
3. Field testing technician shall, at the expense of the MVRA Manufacturer, procure at least one 4 inch (102 mm) cylinder from every day of placement of MVRA dosed concrete for the purpose of subsequent hydraulic conductivity/coefficient of permeability testing.
4. All cylinders shall be independently lab tested in accordance with ASTM D 5084 at the expense of the MVRA manufacturer.
5. Test results must conform to specified limits.
  - a. Should any cylinder from any day of placement deliver results in excess of  $6.0 \text{ E-08 cm/sec}$ , the concrete moisture vapor reduction admixture manufacturer shall procure, at their expense, a core (or cores) from that day of placement. This core (cores) shall be sent to an independent laboratory for hydraulic conductivity (coefficient or permeability) per ASTM D 5084.
  - b. Should any core deliver results in excess of  $6.0 \text{ E-08 cm/sec}$  per ASTM D 5084, the concrete moisture vapor reduction admixture manufacturer shall provide, at their expense, a topical moisture mitigation system for all areas not meeting the stated limit.
6. Proceeding with placement of concrete dosed with the MVRA without the required representation will result in the contractor bearing the cost to core and ship appropriate material for testing per ASTM D 5084.

END OF SECTION 033000

## SECTION 034100 - PRECAST STRUCTURAL CONCRETE

### 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. Precast double tees.
  - 2. Thin-brick faced, precast structural concrete wall panels.

- B. Related Requirements:

- 1. Section 033000 "Cast-in-Place Concrete" for concrete topping and placing connection anchors in concrete.
  - 2. Section 042000 "Unit Masonry" for mortar joint color and shape.
  - 3. Section 051200 "Structural Steel Framing" for furnishing and installing connections attached to structural-steel framing.
  - 4. Section 055000 "Metal Fabrications" for kickers and other miscellaneous steel shapes.

#### 1.3 DEFINITIONS

- A. Design Reference Sample: Sample of approved precast structural concrete color, finish, and texture, preapproved by Architect.

#### 1.4 PREINSTALLATION MEETINGS

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

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each precast concrete mixture. Include compressive strength and, if required, water-absorption tests.

- C. Shop Drawings: Signed and sealed by the engineer licensed in the state to which the project is located and responsible for their preparation. Include member locations, plans, elevations, dimensions, shapes and sections, openings, support conditions, and types of reinforcement, including special reinforcement. Detail fabrication and installation of precast structural concrete units.
1. Include member locations, plans, elevations, dimensions, shapes and sections, openings, support conditions, and types of reinforcement, including special reinforcement.
  2. Detail fabrication and installation of precast structural concrete units, including connections at member ends and to adjoining construction.
  3. Indicate joints, reveals, and extent and location of each surface finish.
  4. Indicate separate face and backup mixture locations and thicknesses.
  5. Indicate welded connections by AWS standard symbols. Show size, length, and type of each weld.
  6. Detail loose and cast-in hardware, lifting and erection inserts, connections, and joints.
  7. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
  8. Include and locate openings larger than by 10 inches (250 mm).
  9. Indicate location of each precast structural concrete unit by same identification mark placed on panel.
  10. Indicate relationship of precast structural concrete units to adjacent materials.
  11. Indicate locations, dimensions and details of thin-brick units, including corner units and special shapes, and joint treatments.
  12. Indicate shim sizes and grouting sequence.
  13. Design Modifications: If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.
- D. Samples:
1. For each type of finish indicated on exposed surfaces of precast structural concrete units with architectural finish, in sets of three, representative of finish, color, and texture variations expected; approximately 12 by 12 by 2 inches (300 by 300 by 50 mm).
    - a. Where other faces of precast concrete unit are exposed, include Samples illustrating workmanship, color, and texture of backup concrete as well as facing concrete.
  2. Samples for each thin-brick unit required, showing full range of color and texture expected. Include Samples showing color and texture of joint treatment.
    - a. Grout Samples for Initial Selection: Color charts consisting of actual sections of grout showing manufacturer's full range of colors.
    - b. Grout Samples for Verification: Showing color and texture of joint treatment.
- E. Delegated-Design Submittal: For precast structural concrete indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the



qualified professional engineer licensed in the state to which the project is located and responsible for their preparation.

1. Show precast structural concrete unit types, connections, types of reinforcement, including special reinforcement, and concrete cover on reinforcement. Indicate location, type, magnitude, and direction of loads imposed on the building structural frames and foundations from precast structural concrete.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and fabricator.
- B. Welding certificates.
- C. Material Certificates: For the following:
  1. Cementitious materials.
  2. Reinforcing materials and prestressing tendons.
  3. Admixtures.
  4. Bearing pads.
  5. Structural-steel shapes and hollow structural sections.
  6. Thin-brick units and accessories.
  7. Insulation.
- D. Material Test Reports: For aggregates, by a qualified testing agency.
- E. Preconstruction test reports.
- F. Source quality-control reports.
- G. Field quality-control and special inspection reports.

## 1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: A firm that assumes responsibility for engineering precast structural concrete units to comply with performance requirements. Responsibility includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
  1. Designated as a PCI-certified plant as follows:
    - a. Group C, Category C3 - Prestressed Straight Strand Structural Members.
    - b. Group CA, Category C3A - Prestressed Straight-Strand Structural Members.
    - c. Group C, Category C4 – Prestressed Deflected-Strand Structural Members.
    - d. Group C, Category C1 – Precast Concrete Products (No Pre-Stressed Reinforcing)
- B. Installer Qualifications: A precast concrete erector qualified and designated by PCI's Certificate of Compliance, to erect Category S2 - Complex Structural Systems.

- C. Installer Qualifications: An experienced precast concrete erector who has retained a "PCI-Certified Field Auditor" to conduct a field audit of a project installed by erector in Category S2 - Complex Structural Systems and who can produce an Erectors' Post Audit Declaration, according to PCI MNL 127, "PCI Erector's Manual - Standards and Guidelines for the Erection of Precast Concrete Products."
- D. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- E. Quality-Control Standard: For manufacturing procedures, testing requirements, and quality-control recommendations for types of units required, comply with PCI MNL 116, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products."
- F. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel."
- G. Sample Panels: After sample approval and before fabricating precast structural concrete units with thin-brick facing, produce a minimum of three sample panels approximately 16 sq. ft. in area for review by Architect. Incorporate full-scale details of architectural features, finishes, textures, and transitions in sample panels.
  - 1. Locate panels as directed by the Construction Manager.
  - 2. Damage part of an exposed-face surface for each finish, color, and texture, and demonstrate adequacy of repair techniques proposed for repair of surface blemishes.
  - 3. After approval of repair technique, maintain one sample panel at fabricator's plant and two at Project site in an undisturbed condition as a standard for judging the completed Work.
  - 4. Demolish and remove sample panels when directed by the Construction Manager.

## 1.8 COORDINATION

- A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction before starting that Work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation.

## 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Support units during shipment on nonstaining shock-absorbing material in same position as during storage.
- B. Store units with adequate bracing and protect units to prevent contact with soil, to prevent staining, and to prevent cracking, distortion, warping or other physical damage.
  - 1. Store units with dunnage across full width of each bearing point unless otherwise indicated.

2. Place adequate dunnage of even thickness between each unit.
  3. Place stored units so identification marks are clearly visible, and units can be inspected.
- C. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.
- D. Lift and support units only at designated points indicated on Shop Drawings.

## PART 2 - PRODUCTS

### 2.1 FABRICATORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Concrete Industries, Inc.
  2. Coreslab Structures (Missouri) Inc.
  3. Cretex.
  4. Enterprise Precast Concrete Inc.
  5. Fabcon.
  6. Molin Concrete Products Company.
  7. Prestressed Casting Company.
  8. TDI Tulsa Dynaspan, Inc.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design precast structural concrete, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design Standards: Comply with ACI 318 and with design recommendations in PCI MNL 120, "PCI Design Handbook - Precast and Prestressed Concrete," applicable to types of precast structural concrete units indicated.
- C. Structural Performance: Precast structural concrete units and connections shall withstand design loads indicated within limits and under conditions indicated.
1. Design precast structural concrete framing system and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, to accommodate live-load deflection, shrinkage and creep of primary building structure, and other building movements. Maintain precast structural concrete deflections within limits of ACI 318.
    - a. Thermal Movements: Allow for in-plane thermal movements resulting from annual ambient temperature changes of 80 deg F (26 deg C).

## 2.3 MOLD MATERIALS

- A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that provides continuous precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.
  - 1. Mold-Release Agent: Commercially produced form-release agent that does not bond with, stain, or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatments of precast concrete.

## 2.4 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60 (Grade 420), deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706, deformed.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- D. Deformed-Steel Welded Wire Reinforcement: ASTM A 497 or ASTM A 1064, flat sheet.
- E. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 116.

## 2.5 PRESTRESSING TENDONS

- A. Pretensioning Strand: ASTM A 416, Grade 270, uncoated, seven-wire, low-relaxation strand.
- B. Post-Tensioning Bars: ASTM A 722, uncoated high-strength steel bar.

## 2.6 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type III, gray, unless otherwise indicated.
  - 1. For surfaces exposed to view in finished structure, use gray or white cement, of same type, brand, and mill source.
- B. Supplementary Cementitious Materials:
  - 1. Fly Ash: ASTM C 618, Class C or F, with maximum loss on ignition of 3 percent.
  - 2. Metakaolin: ASTM C 618, Class N.
  - 3. Silica Fume: ASTM C 1240, with optional chemical and physical requirement.
  - 4. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

- C. Normal-Weight Aggregates: Except as modified by PCI MNL 116, ASTM C 33, with coarse aggregates complying with Class 4S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
  - 1. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample.
    - a. Gradation: To match design reference sample.
  - 2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand compatible with coarse aggregate to match approved finish sample.
- D. Lightweight Aggregates: Except as modified by PCI MNL 117, ASTM C330/C330M, with absorption less than 11 percent.
- E. Water: Potable; free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 116.
- F. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- G. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.
  - 1. Water-Reducing Admixtures: ASTM C 494, Type A.
  - 2. Retarding Admixture: ASTM C 494, Type B.
  - 3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
  - 4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
  - 5. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
  - 6. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
  - 7. Plasticizing Admixture: ASTM C 1017, Type I.
  - 8. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

## 2.7 STEEL CONNECTION MATERIALS

- A. Carbon-Steel Shapes and Plates: ASTM A 36.
- B. Carbon-Steel-Headed Studs: ASTM A 108, Grade 1010 through 1020, cold finished, AWS D1.1/D1.1M, Type A or B, with arc shields and with minimum mechanical properties of PCI MNL 116.
- C. Carbon-Steel Plate: ASTM A 283, Grade C.
- D. Malleable-Iron Castings: ASTM A 47, Grade 32510 or Grade 35028.
- E. Carbon-Steel Castings: ASTM A 27, Grade 60-30 (Grade 415-205).

- F. High-Strength, Low-Alloy Structural Steel: ASTM A 572.
- G. Carbon-Steel Structural Tubing: ASTM A 500, Grade B or Grade C.
- H. Wrought Carbon-Steel Bars: ASTM A 675, Grade 65.
- I. Deformed-Steel Wire or Bar Anchors: ASTM A 496 or ASTM A 706.
- J. Carbon-Steel Bolts and Studs: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); carbon-steel, hex-head bolts and studs; carbon-steel nuts, ASTM A 563 (ASTM A 563M); and flat, unhardened steel washers, ASTM F 844.
- K. High-Strength Bolts and Nuts: ASTM A 325 or ASTM A 490 Type 1, heavy hex steel structural bolts; heavy hex carbon-steel nuts, ASTM A 563; and hardened carbon-steel washers, ASTM F 436.
  - 1. Do not zinc coat ASTM A 490 bolts.
- L. Zinc-Coated Finish: For exterior steel items, steel in exterior walls, and items indicated for galvanizing, apply zinc coating by hot-dip process according to ASTM A 123 or ASTM A 153.
  - 1. For steel shapes, plates, and tubing to be galvanized, limit silicon content of steel to less than 0.03 percent or to between 0.15 and 0.25 percent or limit sum of silicon and 2.5 times phosphorous content to 0.09 percent.
  - 2. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight and complying with DOD-P-21035B or SSPC-Paint 20.
- M. Welding Electrodes: Comply with AWS standards.
- N. Precast Accessories: Provide clips, hangers, plastic or steel shims, and other accessories required to install precast structural concrete units.

## 2.8 BEARING PADS

- A. Provide one of the following bearing pads for precast structural concrete units as recommended by precast fabricator for application:
  - 1. Elastomeric Pads: AASHTO M 251, plain, vulcanized, 100 percent polychloroprene (neoprene) elastomer, molded to size or cut from a molded sheet, 50 to 70 Shore, Type A durometer hardness, ASTM D 2240; minimum tensile strength 2250 psi (15.5 MPa), ASTM D 412.
  - 2. Random-Oriented-Fiber-Reinforced Elastomeric Pads: Preformed, randomly oriented synthetic fibers set in elastomer. 70 to 90 Shore, Type A durometer hardness, ASTM D 2240; capable of supporting a compressive stress of 3000 psi (20.7 MPa) with no cracking, splitting, or delaminating in the internal portions of pad. Test one specimen for every 200 pads used in Project.

3. Cotton-Duck-Fabric-Reinforced Elastomeric Pads: Preformed, horizontally layered cotton-duck fabric bonded to an elastomer; 80 to 100 Shore, Type A durometer hardness, ASTM D 2240; complying with AASHTO's "AASHTO LRFD Bridge Design Specifications," Division II, Section 18.10.2; or with MIL-C-882E.
4. Frictionless Pads: PTFE, glass-fiber reinforced, bonded to stainless- or mild-steel plate, or random-oriented-fiber-reinforced elastomeric pads; of type required for in-service stress.
5. High-Density Plastic: Multimonomer, nonleaching, plastic strip.

## 2.9 ACCESSORIES

- A. Precast Accessories: Provide clips, hangers, high-density plastic or steel shims, and other accessories required to install structural precast concrete units.

## 2.10 GROUT MATERIALS

- A. Nonmetallic, Nonshrink Grout: Packaged, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time. Water-soluble chloride ion content less than 0.06 percent by weight of cement when tested according to ASTM C 1218.

## 2.11 THIN BRICK AND ACCESSORIES

- A. Products: Subject to compliance with requirements, provide the following:
  1. TB-1A: Interstate; Ash.
    - a. Face Size (Actual Dimension): 2-1/4 inches high by 7-5/8 inches long.
  2. TB-1B: Interstate; Pewter.
    - a. Face Size (Actual Dimension): 2-1/4 inches high by 7-5/8 inches long.
  3. Fabricator shall coordinate with masonry contractor to single source the manufacturer of the thin brick product with the face brick product so that there is only one type of brick from the same manufacturer.
- B. Thin Brick: Not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) thick, and as follows:
  1. Dimensional Tolerances: Plus 0 inch (0 mm) or minus 1/16 inch (1.6 mm) for any dimension 8 inches (203 mm) or less and plus 0 inch (0 mm) or minus 3/32 inch (2.4 mm) for any dimension more than 8 inches (203 mm).
  2. Out-of-Square Tolerance: Plus or minus 1/16 inch (1.6 mm).
  3. Warpage Tolerance: Plus 0 inch (0 mm) or minus 1/16 inch (1.6 mm).

4. Variation of Shape from Specified Angle: Plus or minus one degree.
5. Modulus of Rupture: Not less than 250 psi (1.7 MPa) when tested according to ASTM C 67.
6. Tensile Bond Strength: Not less than 150 psi (1.0 MPa) when tested before and after freeze-thaw test according to ASTM E 488 as modified: Adhere a steel plate with a welded rod on a single thin-brick face with epoxy for each test.
7. 24-Hour Cold-Water Absorption: Not more than 6 percent when tested according to ASTM C 67.
8. Freeze-Thaw Resistance: No detectable disintegration or separation after 300 freezing-and-thawing cycles when tested according to ASTM C 666/C 666M, Method B.
9. Chemical Resistance: Tested according to ASTM C 650 and rated "not affected."
10. Efflorescence: Tested according to ASTM C 67 and rated "not effloresced."
11. Surface Coating: Thin brick with colors or textures applied as coatings shall withstand 50 cycles of freezing and thawing; ASTM C 67 with no observable difference in applied finish when viewed from 10 feet (3 m).
12. Back Surface Texture: Scored, combed, wire roughened, ribbed, keybacked, or dovetailed.

C. Special Shapes: Include corners, edge corners, and end edge corners.

D. Pointing Grout: Packaged, polymer-modified, sanded grout complying with ANSI A118.7.

1. Polymer Type: Acrylic resin in dry, redispersible form, packaged with other dry ingredients or liquid-latex form for adding packaged dry-grout mix.
2. Colors: Match mortar used in Section 042000 "Unit Masonry."

## 2.12 INSULATED PANEL ACCESSORIES

- A. Extruded-Polystyrene (XPS) Board Insulation: ASTM C 578, Type IV, 1.55 lb/cu. ft. (25 kg/cu. m); square or ship-lap edges; with thickness as indicated in drawings.
- B. Wythe Connectors: manufacturer's standard fiber composite connectors to connect wythes of precast concrete panels.

## 2.13 CONCRETE MIXTURES

- A. Prepare design mixtures for each type of precast concrete required.
  1. Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent.
  2. Limit use of fly ash to 25 percent replacement of portland cement by weight and ground granulated blast-furnace slag to 40 percent of portland cement by weight; metakaolin and silica fume to 10 percent of portland cement by weight.
- B. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at precast structural concrete fabricator's option.



- C. Limit water-soluble chloride ions to maximum percentage by weight of cement permitted by ACI 318 (ACI 318M) or PCI MNL 116 when tested according to ASTM C 1218/C 1218M.
- D. Normal-Weight Concrete Mixtures: Proportion full-depth mixture by either laboratory trial batch or field test data methods according to ACI 211.1, with materials to be used on Project, to provide normal-weight concrete with the following properties:
  - 1. Compressive Strength (28 Days): 5000 psi (34.5 MPa).
  - 2. Maximum Water-Cementitious Materials Ratio: 0.45.
- E. Water Absorption: For structural precast concrete with an architectural finish, limit water absorption to 6 percent by weight or 14 percent by volume, tested according to ASTM C 642, except for boiling requirement.
- F. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content complying with PCI MNL 116.
- G. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.
- H. Concrete Mix Adjustments: Concrete mix design adjustments may be proposed if characteristics of materials, Project conditions, weather, test results, or other circumstances warrant.

#### 2.14 MOLD FABRICATION

- A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures due to concrete-placement operations and temperature changes and for prestressing and detensioning operations. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of reinforcement and prestressing tendons by release agent.
- B. Maintain molds to provide completed precast structural concrete units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.
  - 1. Edge and Corner Treatment: Uniformly chamfered.

#### 2.15 THIN-BRICK FACINGS

- A. Place form liner templates accurately to provide grid for thin-brick facings. Provide solid backing and supports to maintain stability of liners while placing thin bricks and during concrete placement.
- B. Securely place thin-brick units face down into form liner pockets and place concrete backing mixture.
- C. Completely fill joint cavities between thin-brick units with sand-cement mortar, and place precast concrete backing mixture while sand-cement mortar is still fluid enough to ensure bond.

1. Mortar color shall match the mortar color in the masonry cavity wall construction. Coordinate with the masonry contractor and refer to Section 04200 "Unit Masonry" for color.
- D. Mix and install pointing grout according to ANSI A108.10. Completely fill joint cavities between thin-brick units with pointing grout and compress into place without spreading grout onto faces of thin-brick units. Remove excess grout immediately to prevent staining of thin brick.
  1. Tool joints to a slightly concave shape when pointing grout is thumbprint hard. Coordinate with the masonry contractor so that joint patterns in the thin-brick precast panels matches the joint patterns in the masonry cavity wall construction. Refer to Section 042000 "Unit Masonry".
- E. Clean faces and joints of thin-brick facing.

## 2.16 FABRICATION

- A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where it does not affect position of main reinforcement or concrete placement.
  1. Weld-headed studs and deformed bar anchors used for anchorage according to AWS D1.1/D1.1M and AWS C5.4, "Recommended Practices for Stud Welding."
- B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and other hardware shapes for securing precast structural concrete units to supporting and adjacent construction.
- C. Cast-in reglets, slots, holes, and other accessories in precast structural concrete units as indicated on the Contract Drawings.
- D. Cast-in openings larger than 10 inches (250 mm) in any dimension. Do not drill or cut openings or prestressing strand without Architect's approval.
- E. Reinforcement: Comply with recommendations in PCI MNL 116 for fabricating, placing, and supporting reinforcement.
  1. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy the bond with concrete. When damage to epoxy-coated reinforcement exceeds limits specified in ASTM A 775/A 775M, repair with patching material compatible with coating material and epoxy coat bar ends after cutting.
  2. Accurately position, support, and secure reinforcement against displacement during concrete-placement and consolidation operations. Completely conceal support devices to prevent exposure on finished surfaces.

3. Place reinforcing steel and prestressing strand to maintain at least 3/4-inch (19-mm) minimum concrete cover. Increase cover requirements for reinforcing steel to 1-1/2 inches (38 mm) when units are exposed to corrosive environment or severe exposure conditions. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position while placing concrete. Direct wire tie ends away from finished, exposed concrete surfaces.
  4. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh spacing and wire tie laps, where required by design. Offset laps of adjoining widths to prevent continuous laps in either direction.
- F. Reinforce precast structural concrete units to resist handling, transportation, and erection stresses and specified in-place loads.
- G. Prestress tendons for precast structural concrete units by either pretensioning or post-tensioning methods. Comply with PCI MNL 116.
1. Delay detensioning or post-tensioning of precast, prestressed structural concrete units until concrete has reached its indicated minimum design release compressive strength as established by test cylinders cured under same conditions as concrete unit.
  2. Detension pretensioned tendons either by gradually releasing tensioning jacks or by heat cutting tendons, using a sequence and pattern to prevent shock or unbalanced loading.
  3. If concrete has been heat cured, detension while concrete is still warm and moist to avoid dimensional changes that may cause cracking or undesirable stresses.
  4. Protect strand ends and anchorages with bituminous, zinc-rich, or epoxy paint to avoid corrosion and possible rust spots.
  5. Protect strand ends and anchorages with a minimum of 1-inch- (25-mm-) thick, nonmetallic, nonshrink, grout mortar and sack rub surface. Coat or spray the inside surfaces of pocket with bonding agent before installing grout.
- H. Comply with requirements in PCI MNL 116 and in this Section for measuring, mixing, transporting, and placing concrete. After concrete batching, no additional water may be added.
- I. Place face mixture to a minimum thickness after consolidation of the greater of 1 inch (25 mm) or 1.5 times the maximum aggregate size, but not less than the minimum reinforcing cover specified.
- J. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming in precast concrete units.
1. Place backup concrete mixture to ensure bond with face-mixture concrete.
- K. Thoroughly consolidate placed concrete by vibration without dislocating or damaging reinforcement and built-in items, and minimize pour lines, honeycombing, or entrapped air voids on surfaces. Use equipment and procedures complying with PCI MNL 116.
1. Place self-consolidating concrete without vibration according to PCI TR-6, "Interim Guidelines for the Use of Self-Consolidating Concrete in Precast/Prestressed Concrete Institute Member Plants." Ensure adequate bond between face and backup concrete, if used.

- L. Comply with PCI MNL 116 procedures for hot- and cold-weather concrete placement.
- M. Identify pickup points of precast structural concrete units and orientation in structure with permanent markings, complying with markings indicated on Shop Drawings. Imprint or permanently mark casting date on each precast structural concrete unit on a surface that does not show in finished structure.
- N. Cure concrete, according to requirements in PCI MNL 116, by moisture retention without heat or by accelerated heat curing using live steam or radiant heat and moisture. Cure units until compressive strength is high enough to ensure that stripping does not have an effect on performance or appearance of final product.
- O. Discard and replace precast structural concrete units that do not comply with requirements, including structural, manufacturing tolerance, and appearance, unless repairs meet requirements in PCI MNL 116 and meet Architect's approval.

#### 2.17 CASTING INSULATED WALL PANELS

- A. Cast, screed, and consolidate wythe supported by mold.
- B. Place insulation boards abutting edges and ends of adjacent boards. Insert wythe connectors through insulation and consolidate concrete around connectors according to connector manufacturer's written instructions.
- C. Ensure bottom wythe and insulation layer are not disturbed after bottom wythe reaches initial set.
- D. Cast, screed, and consolidate top wythe to meet required finish.
- E. Maintain temperature below 150 deg F (65 deg C) in bottom concrete wythe.

#### 2.18 FABRICATION TOLERANCES

- A. Fabricate precast structural concrete units to shapes, lines, and dimensions indicated so each finished unit complies with PCI MNL 116 product dimension tolerances as well as position tolerances for cast-in items.
- B. Thin-Brick-Faced Precast Structural Concrete Units: Restrict the following misalignments to 2 percent of number of thin bricks in a unit:
  - 1. Alignment of Mortar Joints:
    - a. Jog in Alignment: 1/8 inch (3 mm).
    - b. Alignment with Panel Centerline: Plus or minus 1/8 inch (3 mm).
  - 2. Variation in Width of Exposed Mortar Joints: Plus or minus 1/8 inch (3 mm).

3. Tipping of Individual Thin Bricks from the Panel Plane of Exposed Thin-Brick Surface: Plus 0 inch (0 mm); minus 1/4 inch (6 mm) less than or equal to depth of form-liner joint.
4. Exposed Thin-Brick Surface Parallel to Primary Control Surface of Panel: Plus 1/4 inch (6 mm); minus 1/8 inch (3 mm).
5. Individual Thin-Brick Step in Face from Panel Plane of Exposed Thin-Brick Surface: Plus 0 inch (0 mm); minus 1/4 inch (6 mm) less than or equal to depth of form-liner joint.

## 2.19 COMMERCIAL FINISHES

- A. Commercial Grade: At interior face of wall panels, remove fins and protrusions larger than 1/8-inch (3 mm) and fill holes larger than 1/2-inch (13 mm). Rub or grind ragged edges. Faces must have true, well-defined surfaces. Air holes, water marks and color variations are permitted. Limit form joint offsets to 3/16-inch (5 mm).
- B. Smooth, steel trowel finish, unformed surfaces. Consolidate concrete, bring to proper level with straight edge, float and trowel to a smooth, uniform finish.

## 2.20 COMMERCIAL ARCHITECTURAL FINISHES

- A. Manufacture members faces free of joint marks, grain, and other obvious defects with corners, including false joints, uniform and straight. Finish exposed-face surfaces of precast concrete units to match approved sample panels and as follows:
  1. As-Cast-Surface Finish: Provide surfaces to match approved sample or mockup for acceptable surface, air voids, sand streaks and honeycomb. Provide as-cast-surface finish at exterior side-faces not receiving thin-brick facing.
  2. Thin-Brick Facing: See "Thin-Brick Facings" Article.

## 2.21 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to evaluate precast structural concrete fabricator's quality-control and testing methods.
  1. Allow testing agency access to material storage areas, concrete production equipment, concrete placement, and curing facilities. Cooperate with testing agency and provide samples of materials and concrete mixtures as may be requested for additional testing and evaluation.
- B. Testing: Test and inspect precast structural concrete according to PCI MNL 116 requirements and ASTM C 1610/C 1610M, ASTM C 1611/C 1611M, ASTM C 1621/C 1621M, and ASTM C 1712/C 1712M.
  1. Test and inspect self-consolidating concrete according to PCI TR-6.
- C. Strength of precast structural concrete units is considered deficient if units fail to comply with ACI 318 (ACI 318M) requirements for concrete strength.

- D. If there is evidence that strength of precast concrete units may be deficient or may not comply with ACI 318 (ACI 318M) requirements, employ a qualified testing agency to obtain, prepare, and test cores drilled from hardened concrete to determine compressive strength according to ASTM C 42/C 42M.
1. A minimum of three representative cores shall be taken from units of suspect strength, from locations directed by Architect.
  2. Test cores in an air-dry condition or, if units are wet under service conditions, test cores after immersion in water in a wet condition.
  3. Strength of concrete for each series of three cores is considered satisfactory if average compressive strength is equal to at least 85 percent of 28-day design compressive strength and no single core is less than 75 percent of 28-day design compressive strength.
  4. Report test results in writing on same day that tests are performed, with copies to Architect, Contractor, and precast concrete fabricator. Test reports include the following:
    - a. Project identification name and number.
    - b. Date when tests were performed.
    - c. Name of precast concrete fabricator.
    - d. Name of concrete testing agency.
    - e. Identification letter, name, and type of precast concrete unit(s) represented by core tests; design compressive strength; type of break; compressive strength at breaks, corrected for length-diameter ratio; and direction of applied load to core in relation to horizontal plane of concrete as placed.
- E. Patching: If core test results are satisfactory and precast structural concrete units comply with requirements, clean and dampen core holes and solidly fill with same precast concrete mixture that has no coarse aggregate, and finish to match adjacent precast concrete surfaces.
- F. Defective Units: Discard and replace precast structural concrete units that do not comply with requirements, including strength, manufacturing tolerances, and color and texture range. Chipped, spalled, or cracked units may be repaired, subject to Architect's approval. Architect reserves the right to reject precast units that do not match approved samples, sample panels, and mockups. Replace unacceptable units with precast concrete units that comply with requirements.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine supporting structural frame or foundation and conditions for compliance with requirements for installation tolerances, bearing surface tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

- C. Do not install precast concrete units until supporting, cast-in-place concrete has attained minimum allowable design compressive strength and until supporting steel or other structure is structurally ready to receive loads from precast concrete units.

### 3.2 INSTALLATION

- A. Install clips, hangers, bearing pads, and other accessories required for connecting precast structural concrete units to supporting members and backup materials.
- B. Erect precast structural concrete level, plumb, and square within specified allowable tolerances. Provide temporary structural framing, shoring, and bracing as required to maintain position, stability, and alignment of units until permanent connections are complete.
  - 1. Install temporary steel or plastic spacing shims or bearing pads as precast structural concrete units are being erected. Tack weld steel shims to each other to prevent shims from separating.
  - 2. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
  - 3. Remove projecting lifting devices and use plastic patch caps or sand-cement grout to fill voids within recessed lifting devices flush with surface of adjacent precast surfaces when recess is exposed.
  - 4. For hollow-core slab voids used as electrical raceways or mechanical ducts, align voids between units and tape butt joint at end of slabs.
- C. Connect precast structural concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, and spacers as soon as practical after connecting and grouting are completed.
  - 1. Do not permit connections to disrupt continuity of roof flashing.
- D. Field cutting of precast units is not permitted without approval of Architect.
- E. Fasteners: Do not use drilled or powder-actuated fasteners for attaching accessory items to precast, prestressed concrete units.
- F. Welding: Comply with applicable requirements in AWS D1.1/D1.1M and AWS D1.4/D1.4M for welding, welding electrodes, appearance, quality of welds, and methods used in correcting welding work.
  - 1. Protect precast structural concrete units and bearing pads from damage by field welding or cutting operations, and provide noncombustible shields as required.
  - 2. Clean weld-affected steel surfaces with chipping hammer followed by brushing, and apply a minimum 4.0-mil- (0.1-mm-) thick coat of galvanized repair paint to galvanized surfaces according to ASTM A 780/A 780M.
  - 3. Clean weld-affected steel surfaces with chipping hammer followed by brushing, and reprime damaged painted surfaces.
  - 4. Visually inspect welds and remove, reweld, or repair incomplete and defective welds.

- G. At bolted connections, use lock washers, tack welding, or other approved means to prevent loosening of nuts after final adjustment.
  - 1. Where slotted connections are used, verify bolt position and tightness. For sliding connections, properly secure bolt but allow bolt to move within connection slot.
- H. Grouting or Dry-Packing Connections and Joints: Grout connections and joints and open spaces at keyways, connections, and joints where required or indicated on Shop Drawings. Retain flowable grout in place until hard enough to support itself. Alternatively, pack spaces with stiff dry-pack grout material, tamping until voids are completely filled.
  - 1. Place grout and finish smooth, level, and plumb with adjacent concrete surfaces.
  - 2. Fill joints completely without seepage to other surfaces.
  - 3. Trowel top of grout joints on roofs smooth and uniform. Finish transitions between different surface levels not steeper than 1 to 12.
  - 4. Place grout end cap or dam in voids at ends of hollow-core slabs.
  - 5. Promptly remove grout material from exposed surfaces before it affects finishes or hardens.
  - 6. Keep grouted joints damp for not less than 24 hours after initial set.

### 3.3 ERECTION TOLERANCES

- A. Erect precast structural concrete units level, plumb, square, and in alignment without exceeding the noncumulative erection tolerances of PCI MNL 135.
- B. Minimize variations between adjacent slab members by jacking, loading, or other method recommended by fabricator and approved by Architect.

### 3.4 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
  - 1. Erection of precast structural concrete members.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Visually inspect field welds and test according to ASTM E 165 or to ASTM E 709 and ASTM E 1444. High-strength bolted connections are subject to inspections.
- D. Testing agency will report test results promptly and in writing to Contractor and Architect.
- E. Repair or remove and replace work where tests and inspections indicate that it does not comply with specified requirements.
- F. Additional testing and inspecting, at Contractor's expense, shall be performed to determine compliance of replaced or additional work with specified requirements.



- G. Prepare test and inspection reports.

### 3.5 REPAIRS

- A. Repair precast structural concrete units if permitted by Architect.
  - 1. Repairs may be permitted if structural adequacy, serviceability, durability, and appearance of units have not been impaired.
- B. Mix patching materials and repair units so cured patches blend with color, texture, and uniformity of adjacent exposed surfaces and show no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from a distance of 20 feet (6 m).
- C. Prepare and repair damaged galvanized coatings with galvanizing repair paint according to ASTM A 780/A 780M.
- D. Wire brush, clean, and paint damaged prime-painted components with same type of shop primer.
- E. Remove and replace damaged precast structural concrete units that cannot be repaired or when repairs do not comply with requirements as determined by Architect.

### 3.6 CLEANING

- A. Clean mortar, plaster, fireproofing, weld slag, and other deleterious material from concrete surfaces and adjacent materials immediately.
- B. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, and stains.
  - 1. Perform cleaning procedures, if necessary, according to precast concrete fabricator's written recommendations. Protect other work from staining or damage due to cleaning operations.
  - 2. Do not use cleaning materials or processes that could change the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 034100



## SECTION 042000 - UNIT MASONRY

### 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. Concrete masonry units where Wall Types M8, M8.1, M12 are indicated
2. Ground-face concrete masonry units where EM-1 is indicated.
3. Face brick where FB-1, FB-1A, FB-2, FB-3 are indicated
4. Mortar and grout.
5. Steel reinforcing bars.
6. Masonry-joint reinforcement.
7. Ties and anchors.
8. Embedded flashing.
9. Moisture barrier.
10. Miscellaneous masonry accessories.
11. Masonry-cell fill.
12. Mineral wool insulation at loose lintels.
13. Weep vents.

B. Products Installed but not Furnished under This Section:

1. Steel lintels in unit masonry.
2. Cavity wall insulation.

C. Related Requirements:

1. Section 051200 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
2. Section 072100 "Thermal Insulation" for cavity wall insulation.
3. Section 072726 "Fluid-Applied Membrane Air Barriers" for surface preparation and insulation installation over metal stud and sheathing backup walls.
4. Section 076200 "Sheet Metal Flashing and Trim" for sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.
5. Section 076200 "Joint Sealants" for sealing control and expansion joints in unit masonry.

D. Products installed, but not furnished, under this Section include the following:

1. Steel lintels for unit masonry, furnished under Section 055000 "Metal Fabrications."

### 1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site. Include the following, but not limited to:
  1. Owner.
  2. Owner's masonry consultant.
  3. Architect.
  4. Construction manager.
  5. Masonry contractor.
  6. Air Barrier contractor.
  7. Joint sealants contractor.

### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
  1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
  2. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
  3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
- C. Samples for Initial Selection: For the following:
  1. Flexible through wall flashing.
  2. Weep vents.
- D. Samples for Verification: For each type and color of the following:
  1. CMUs.
  2. Ground-face concrete masonry units.
  3. Face brick, in the form of straps of five or more bricks.
  4. Adjustable veneer anchors.

## 1.6 INFORMATIONAL SUBMITTALS

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
  - 1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- B. Qualification Data: For testing agency.
- C. Material Certificates: For each type and size of the following:
  - 1. Masonry units.
    - a. Include material test reports substantiating compliance with requirements.
    - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
    - c. For exposed brick, include test report for efflorescence according to ASTM C67.
    - d. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
  - 2. Cementitious materials. Include name of manufacturer, brand name, and type.
  - 3. Mortar admixtures.
  - 4. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
  - 5. Grout mixes. Include description of type and proportions of ingredients.
  - 6. Reinforcing bars.
  - 7. Joint reinforcement.
  - 8. Anchors, ties, and metal accessories.
  - 9. Flexible flashing: Include independent testing to verify the 8 mil and 32 mil requirements.
- D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
  - 1. Include test reports, according to ASTM C1019, for grout mixes required to comply with compressive strength requirement.
- E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to TMS 602.
- F. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

## 1.7 QUALITY ASSURANCE

- A. Subcontractors: The following is a list of pre-approved masonry subcontractors. No others will be permitted:
1. D & D Masonry, Inc.
  2. Five Star Masonry, LLC.
  3. JusPatTon Construction, Inc.
  4. Mid-States Masonry, LLC.
  5. Prestige Masonry LLC.
  6. Summit Masonry, Inc.
- B. Testing Agency Qualifications: Qualified according to ASTM C1093 for testing indicated.
- C. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
- D. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from a single manufacturer for each cementitious component and from one source or producer for each aggregate.
- E. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, unless modified by more restrictive requirements in the Contact Documents.
- F. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.
- G. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
1. Build mockups in presence of Masonry Consultant, Architect, and Owner for each typical exterior wall construction.
  2. Build mockup as indicated on Drawings, including face and backup wythes and accessories.
    - a. Include a sealant-filled joint at least 16 inches (400 mm) long in mockup.
    - b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches (300 mm) wide by 16 inches (400 mm) high.
    - c. Include through-wall flashing installed for a 24-inch (600-mm) length in corner of exterior wall mockup approximately 16 inches (400 mm) down from top of mockup, with a 12-inch (300-mm) length of flashing left exposed to view (omit masonry above half of flashing).
    - d. Include metal studs, sheathing, fluid-applied air barrier, Board Product Air Barrier, veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockups.

3. Clean one half of exposed faces of mockups with masonry cleaner as indicated.
4. Protect accepted mockups from the elements with weather-resistant membrane.
5. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
  - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
  - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
6. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

H. Masonry Review:

1. Owner's Masonry Consultant:
  - a. The Contractor is responsible for notifying the Masonry Consultant about the progress of the masonry work, providing access, and facilitating the timely site visits.
  - b. Masonry Consultant:
    - 1) Donald McMican, PE; DGM Consultants, P.A.; phone 913-894-2048; 10251 Goddard Street; Overland Park, KS 66214.
2. Periodic masonry observation by the Owner's representative, Masonry Consultant, or Architect will be required at appropriate intervals during construction as masonry progresses. At a minimum, the following inspections shall be conducted:
  - a. All backup-wall air barrier applications shall be reviewed and accepted, in writing, by Owner's representative, or other qualified individual, to ensure that the application is complete and free from any problems that will allow moisture to penetrate through to the substrate.
  - b. All flashing systems shall be reviewed and accepted, in writing, by Owner's representative or other qualified individual, to ensure that the application is complete, and properly attached.
3. Any work that is performed by the Contractor prior to receipt and approval of submittals shall be removed and reinstalled at the Contractor's expense, and shall be enforced by the Design Consultant in conjunction with the District's Masonry Consultant.
4. Any flashing assembly that is covered over by installation of masonry veneer prior to observations and acceptance of the flashing system shall be removed and reinstalled at the Contractor's expense, and shall be enforced by the Design Consultant in conjunction with the District's Masonry Consultant.
5. In addition to the Owner's Masonry Consultant, the Owner will engage Masonry Inspectors to perform quality assurance during construction of reinforced concrete masonry construction.

I. Owner's Special Inspector:

1. In addition to the Owner's Masonry Consultant, the Owner will employ Masonry Inspectors to perform quality assurance during construction of reinforced concrete masonry construction.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  1. Extend cover a minimum of 24 inches (600 mm) down both sides of walls, and hold cover securely in place.
  2. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  2. Protect sills, ledges, and projections from mortar droppings.



3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602.
1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Provide structural unit masonry that develops 2,000 psi net-area compressive strengths at 28 days.
  1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602.

### 2.3 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the

standard. Do not use units where such defects, including dimensions that vary from specified dimensions by more than stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.

#### 2.4 GROUND-FACE CONCRETE MASONRY UNITS (EM-1)

- A. Basis-of-Design Products: Subject to compliance with requirements, provide Trenwyth; Trendstone Plus filled and polished ground-faced masonry units, or comparable product by one of the following:
  - 1. York Building Products.
- B. Shapes: Provide shapes indicated and as follows:
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
  - 2. Provide bullnose units for outside corners, unless otherwise indicated.
- C. Pattern and Texture:
  - 1. Pattern: Running bond.
  - 2. Texture: Filled and polished ground face for graffiti-resistance, all exterior sides exposed to public view, including recessed entry alcoves, except as follows:
    - a. All sides of Dugout Buildings.
  - 3. Color: Gray Stone.
- D. Ground-face CMU's: ASTM C 90.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2,650 psi (13.1 MPa).
  - 2. Weight Classification: Lightweight.
  - 3. Size (Width): Manufactured to the following dimensions:
    - a. 8 inches (200 mm) nominal: 7-5/8 inches (194 mm) actual.
- E. Stain-Resistance: ASTM C744 Standard Specification for preferred concrete and calcium silicate masonry units.
- F. Integral Water Repellent: Provide units made with integral water repellent.
  - 1. Integral Water Repellent: Liquid polymeric, integral water-repellent admixture that does not reduce flexural bond strength. Units made with integral water repellent, when tested according to ASTM E 514 as a wall assembly made with mortar containing integral

water-repellent manufacturer's mortar additive, with test period extended to 24 hours, shall show no visible water or leaks on the back of test specimen.

- a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1) ACM Chemistries.
  - 2) BASF Corporation.
  - 3) GCP Applied Technologies, Inc.

## 2.5 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
  - 2. Provide outside corner conditions for units as shown below unless otherwise indicated:
    - a. Exterior Locations: Square.
    - b. Interior Locations: Bullnose.
- B. CMUs: ASTM C90.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2,650 psi.
  - 2. Density Classification: Lightweight.
  - 3. Size (Width): Manufactured to dimensions 3/8 inch (10 mm) less than nominal dimensions.
  - 4. Exposed Faces: Provide color and texture matching the range represented by Architect's sample.

## 2.6 MASONRY LINTELS

- A. Masonry Lintels: Built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Temporarily support built-in-place lintels until cured.

## 2.7 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
  - 1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.

2. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
3. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.

B. Face Brick: Facing brick complying with ASTM C216.

1. Subject to compliance with requirements, provide the following:
  - a. Brick FB-1A:
    - 1) Manufacturer: Interstate Brick
    - 2) Color/Texture, Bond: Ash; one-half running bond.
  - b. Brick FB-1B:
    - 1) Manufacturer: Interstate Brick
    - 2) Color/Texture, Bond: Pewter; one-half running bond.
  - c. Brick FB-2:
    - 1) Manufacturer: Endicott
    - 2) Color/Texture, Bond: Manganese Ironspot; one-half running bond.
  - d. Brick FB-3:
    - 1) Manufacturer: Endicott
    - 2) Color/Texture, Bond: Light Gray Blend Velour; one-half running bond.
2. Grade: SW.
3. Type: FBX.
4. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 6,200 psi.
5. Initial Rate of Absorption: 5 to 25 sq. in. per minute when tested according to ASTM C67.
6. Efflorescence: Provide brick that has been tested according to ASTM C67 and is rated "not effloresced."
7. Size (Actual Dimensions): 3-5/8 inches (92 mm) wide by 2-1/4 inches (57 mm) high by 7-5/8 inches (194 mm) long.
8. Application: Use where brick is exposed unless otherwise indicated.

2.8 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C150/C150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color.
  1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C114.

- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Aggregate for Mortar: ASTM C144.
  - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
- E. Aggregate for Grout: ASTM C404.
- F. Cold-Weather Admixture: Nonchloride, noncorrosive, accelerating admixture complying with ASTM C494/C494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Addiment Incorporated; Mortar Kick.
    - b. Euclid Chemical Company (The); an RPM company; Accelguard 80.
    - c. Grace Construction Products; W.R. Grace & Co. -- Conn.; Morset.
    - d. Sonneborn, Div, of ChemRex; Trimix-NCA.
- G. Water-Repellent Admixture: Provide liquid water-repellent mortar admixture for use with Decorative CMUs containing integral water repellent by same manufacturer.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. ACM Chemistries, Inc.; RainBloc for Mortar.
    - b. BASF Corporation; Rheopel Mortar Admixture.
    - c. GCP Applied Technologies, Inc.; Dry-Block Mortar Admixture.
- H. Water: Potable.
- I. Anti-Graffiti Coating: clear-drying, water-based silicone emulsion for weatherproofing concrete block and other porous masonry materials and protecting them from graffiti attacks without altering the natural appearance.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Prosoco, Inc.: Sure Klean Weather Seal Blok-Guard & Graffiti Control II.

## 2.9 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A615/A615M or ASTM A996/A996M, Grade 60 (Grade 420).
- B. Reinforcing Bar Positioners: ASTM A 1064/A 1064M
  - 1. Z-shaped wire (with 1-1/8" ID elongated loop welded to Z shaped wire) units designed to fit into mortar bed joints spanning masonry unit cells and to hold reinforcing bars in center of cells.
  - 2. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication ASTM A 153.
  - 3. Provide units designed for number of bars indicated.
  - 4. Product: Subject to compliance with requirements, provide the following or pre-approved equal:
    - a. Single Bar (Per Cell): Hohmann & Barnard, Inc.: RB-815.
- C. Masonry-Joint Reinforcement, General: ASTM A951/A951M.
  - 1. Interior Walls: Hot-dip galvanized carbon steel.
  - 2. Exterior Walls: Hot-dip galvanized carbon steel.
  - 3. Wire Size for Side Rods: 0.148-inch diameter.
  - 4. Wire Size for Cross Rods: 0.148-inch diameter.
  - 5. Wire Size for Veneer Ties: 0.148-inch diameter.
  - 6. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
  - 7. Provide in lengths of not less than 10 feet with prefabricated corner and tee units.
- D. Masonry-Joint Reinforcement for Single-Wythe Masonry: Ladder type with single pair of side rods.
- E. Masonry-Joint Reinforcement for Multi-wythe Masonry: Ladder type with single pair of side rods in structural wythe only.

## 2.10 TIES AND ANCHORS

- A. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
  - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A82/A82M, with ASTM A153/A153M, Class B-2 coating.
  - 2. Galvanized Steel Sheet: ASTM A 653/A 653M, Commercial Steel, G60 (Z180) zinc coating.
  - 3. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- B. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 3/4-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.

- C. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches (100 mm) wide.
1. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches long may be used for masonry constructed from solid units or hollow units laid with cells horizontal.
  2. Wire:
    - a. Fabricate from 3/16-inch- diameter, hot-dip galvanized steel wire.
    - b. At Contractor's Option: Use stainless steel wire so ties can be field bent.
- D. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- (6.35-mm-) diameter, hot-dip galvanized steel wire.
  2. Tie Section: Triangular-shaped wire tie made from 0.25-inch- (6.35-mm-) diameter, hot-dip galvanized steel wire.
- E. Adjustable Anchors for Connecting to Concrete: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
1. Products: Subject to compliance with requirements, provide the following:
    - a. No. 75; Heckmann Pos-I-Tie® Concrete/CMU screw.
    - b. No 75-TC; Pos-I-Tie® ThermalClip®.
    - c. No 282-N; Pintle Wire Tie.
    - d. No. 610: ThermalGrip® insulation fasteners.
- F. Adjustable Masonry-Veneer Anchors:
1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf (445-N) load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch (1.5 mm).
  2. Fabricate wire ties from 0.188-inch diameter, hot-dip galvanized-steel wire unless otherwise indicated.
    - a. Basis-of-Design Product: Subject to compliance with requirements, provide the following or pre-approved equal:
      - 1) Wire-Bond: Series 800 Ladder Level-Eye (Hook & Eye).
- G. Masonry-Veneer Anchors:
1. General: Provide anchors that allow vertical adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:

- a. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in both tension and compression without deforming or developing play in excess of 0.05 inch.
  - b. Fabricate sheet metal anchor sections and other sheet metal parts from 12 gauge, steel sheet, galvanized after fabrication.
  - c. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.187-inch diameter, hot-dip galvanized steel wire.
  - d. Provide additional anchors to maintain spacing such that they are spaced at not more than 24 inches o.c. vertically and with not less than 1 anchor for each 2.67 sq. ft. of wall area.
2. Fastener-attached, Masonry-Veneer Anchors: Units consisting of a wire tie and a metal anchor section.
  3. At Veneer-covered AHU Backup:
    - a. Anchor Section: Sheet metal plate, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom and with raised rib-stiffened strap, 5/8-inch-wide by 3-5/8 inches long, stamped into center to provide a slot between strap and plate for inserting wire tie. Fasten with two screws.
      - 1) Basis-of-Design Product: Subject to compliance with requirements, provide Hohmann & Barnard, Inc; DW10HS or pre-approved equal.
  4. At Cavity Wall Insulation (072100):
    - a. Units consisting of a wire tie and a metal anchor section.
    - b. Application:
      - 1) Anchors below base flashing.
      - 2) Anchors at stud backup with continuous insulation.
      - 3) Anchors at roof connection (CMU backup)
    - c. Anchor Section: Rib-stiffened, sheet metal plate with screw holes top and bottom, 2-3/4 inches wide by 3 inches high; with projecting tabs having slotted holes for inserting vertical legs of wire tie specially formed to fit anchor section. Fasten with two concrete screw anchors or drive pins.
      - 1) Size to fit in cavity (may require insulation to be penetrated by pintles).
      - 2) Basis-of-Design Products: Subject to compliance with requirements, provide one of the following:
        - a) Hohmann & Barnard, Inc; HB 213.
        - b) Wire-Bond; #2401 RJ-711.
    - d. Fabricate sheet metal anchor sections and other sheet metal parts from 12 gage steel sheet, galvanized after fabrication.
    - e. Wire Ties: Triangular-, rectangular-, or T-shaped wire ties fabricated from 0.188-inch diameter, hot-dip galvanized steel wire.



## 2.11 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with Section 076200 "Sheet Metal Flashing and Trim" and as follows:
1. Stainless Steel: ASTM A 240/A 240M, Type 304:
    - a. 26 gage for backing plate at butt laps.
    - b. 22 gage for receiver flashing and metal sealant stop.
  2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet.
  3. Metal Sealant Stop
    - a. Fabricate from stainless steel. Extend at least 4 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 1/4 inch to form a stop for retaining sealant backer rod. Close hem enough to limit overall height of flashing to 5/16 inch and yet allow enough gap for backing plate.
    - b. Provide flat backing plates (4 inches wide by 6 inches long) at joints of formed, smooth metal flashing.
  4. Receiver: Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet.
    - a. Shelf Angle: Form horizontal leg flat 7 inches wide.
    - b. Masonry Substrate: Form a 4-inch horizontal leg with a 1/2-inch turned down leg at back of brick.
    - c. Face of Wall: Project 3/8-inch past face of wall and bend down 1 inch at a 45-degree angle to form an inch deep S-folded pocket and a 1-1/2-inch back leg to connect counter flashing.
    - d. Size pieces with 1/4-inch gaps.
  5. Backing Plates: Provide 6-inch long backing plates at butt joints of formed, smooth metal flashing.
    - a. Metal Sealant Stop: 4-1/2 inches wide.
    - b. Receiver:
      - 1) Shelf Angle: 7 inches wide with 7/8-inch long 45-degree front edge.
      - 2) Masonry: 4 inches wide with 7/8-inch long 45-degree front edge.
  6. Adhesive to adhere stainless steel flashing to top of lintel or substrate:
    - a. Basis-of-Design Products: Subject to compliance with requirements, provide the following or approved equal:
      - 1) MasterSeal; NP1.

7. Silicone sealant between stainless steel flashing at butt-laps.
- B. Flexible Flashing: For flashing not exposed to the exterior, use the following unless otherwise indicated:
1. Rubberized-Asphalt Flashing:
    - a. Composite flashing product consisting of a pliable, 32 mil thick adhesive SBS rubberized-asphalt compound, bonded to an 8-mil high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.
    - b. Products: Subject to compliance with requirements, provide one of the following:
      - 1) Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.
      - 2) Grace Construction Products; Perm-A-Barrier Wall Flashing.
  2. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates, and as follows:
    - a. Solvent based primer for bonding flexible rubberized-asphalt flashing to substrates.
      - 1) Liquid applied with roller or brush.
      - 2) Spray adhesive recommended by manufacturer.
      - 3) Products: Subject to compliance with requirements, provide one of the following:
        - a) Carlisle Coatings & Waterproofing; Travel-Tack.
        - b) Carlisle Coatings & Waterproofing; Cav-Grip
      - 4) Prime top of brick at base flashing locations.
      - 5) Prime backup where there is no air barrier.
    - b. Mastic for exposed edges of lap seams.
    - c. Butyl Tape:
      - 1) AHU base flashing: One-sided, 4-inch wide butyl tape to terminate top of base flashing.
- C. Application: Unless otherwise indicated, use the following:
1. Where flashing is indicated to receive counterflashing, use metal flashing.
  2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
  3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge.
  4. Where flashing is fully concealed, use flexible flashing.
- D. Single-Wythe CMU Flashing System: System of CMU cell flashing pans and interlocking CMU web covers made from UV-resistant, high-density polyethylene. Cell flashing pans have integral

weep spouts designed to be built into mortar bed joints and that extend into the cell to prevent clogging with mortar.

1. Product: Subject to compliance with requirements, provide the following:

- a. Mortar Net USA, Ltd; Blok-Flash.

## 2.12 MOISTURE BARRIER

- A. Rubberized-Asphalt Moisture Barrier: Composite product consisting of a pliable, adhesive 32 mil rubberized-asphalt compound, bonded to a high-density, 8 mil cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.
- b. Grace Construction Products; Perm-A-Barrier wall flashing.

- B. Application: Unless otherwise indicated, use the following:

1. Moisture barrier at base of CMU wall from footing to 8 inches above horizontal flashing elevation.

- C. Primers and Mastic: Manufacturer's standard products or products recommended by flashing manufacturer for bonding sheets to substrates and as follows:

1. Solvent based primer for bonding flexible moisture barrier to substrates.

- a. Liquid applied with roller or brush.
- b. Spray adhesive recommended by manufacture.

- 1) Basis-of-Design: Subject to compliance with requirements, provide one of the following:

- a) Carlisle Coatings & Waterproofing; Travel-Tack.
- b) Carlisle Coatings & Waterproofing; Cav-Grip

- 2) Mastic for exposed edges of lap seams.

- D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

## 2.13 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.

1. Thickness:
    - a. Jambs 3/8 inch.
    - b. Expansion Joints: 1/2 inch
  2. Width:
    - a. Expansion joints above base flashing: 3 inches, held back 1 inch.
    - b. Expansion joints below base flashing: 6 inches, held back 1 inch.
    - c. Jambs: 4 inches
- B. Weep/Cavity Vent Products: Use the following unless otherwise indicated:
1. Mesh Weep/Vent: Free-draining mesh; made from polyethylene strands, full width of head joint, 2 inches high, and depth 1/8 inch (3 mm) less than depth of outer wythe; in color selected from manufacturer's standard.
    - a. Application: Use only for weeps.
    - b. Products: Subject to compliance with requirements, provide the following:
      - 1) CavClear/Archovations, Inc.; CavClear Weep Vents.
      - 2) Mortar Net USA, Ltd; Mortar Net Weep Vents.
- C. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Configuration: Provide the following:
    - a. Strips, full depth of cavity and 10 inches (250 mm) high, with dovetail-shaped notches 7 inches (175 mm) deep that prevent clogging with mortar droppings.
    - b. Thickness: 2 inches.
    - c. Products: Subject to compliance with requirements, provide the following:
      - 1) Archovations Inc.; CavClear Masonry Mat.
      - 2) Mortar Net USA LTD.; Mortar Net Wall Defender.
  2. Application: Use only at base of walls with nominal 2-inch deep cavities.
- D. Cavity Drainage Mat: Continuous mat designed for masonry cavities less than one inch wide to prevent mortar from making contact with the backup and ensure water management. The masonry mat shall be fluid conducting, non-absorbent, mold and mildew resistant polymer mesh consisting of 100% recycled plastic with binder. Masonry drainage mat is to be a non-woven textile product in random pattern and have voids no greater than 1/4 inch in diameter.
1. Product: Subject to compliance with requirements, provide the following:
    - a. Mortar Net USA Ltd.; Wall Net.
  2. Thickness: 0.4 to 0.5 inch thick.

3. Height: 10 inches to cover full height of opening at roof connection.

E. Fasteners:

1. Concrete Screw Anchor: 1/4 inch by 1.25 inches.
  - a. Products: Subject to compliance with requirements, provide one of the following:
    - 1) Hilti KH.
    - 2) Powers Fasteners; Tapper.
    - 3) Tapcon.
2. Drive Pin (Termination bar fastener at concrete backup):
  - a. Products: Subject to compliance with requirements, provide the following:
    - 1) Powers Fasteners: Zamic Nailin, with stainless steel pin, 1/4-inch diameter.
      - a) Concrete Backup Walls: 1 inch long (PN 2858).
3. Stainless-Steel Drill Screws: Proprietary fastener consisting of carbon-steel drill point and 300 Series stainless-steel shank, complying with ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 diameter by length required to penetrate steel with not less than three exposed threads.
  - a. Products: Subject to compliance with requirements, provide one of the following:
    - 1) Dayton Superior Corporation, Dur-O-Wal Division; Stainless Steel SX Fastener.
    - 2) ITW Buildex; Scots Long-Life Tek.
4. Stone Trim Dowels:
  - a. Material: Fabricate dowels from stainless steel, ASTM A 276, Type 304.
  - b. Size: 1/2-inch diameter by 4 inches long.
  - c. Adhesive to adhere stainless steel dowels:
    - 1) Products: Subject to compliance with requirements, provide the following or approved equal:
      - a) MasterSeal; NP1.

- F. Winged Termination Bar: 3003-H14, 3105-H14, 6063-T5, or T6 Aluminum 1 inch wide double-winged style 0.087-inch-thick, 45 degree angled wings top and bottom, and with slotted holes (0.28 inch by 0.039 inch) for fasteners at about 4 inches on center.
1. Attached with power-actuated pneumatic pins or self-drilling screws at steel beam backup at 8 inches o.c.
  2. Product: Subject to compliance with requirements, provide the following:

- a. Firestone Building Products; W56RAC3061.

G. Injection Adhesive: Injectable, two-component hybrid adhesive.

1. Product: Subject to compliance with requirements, provide the following:
  - a. Hilti; HIT-HY 200 Safe Set Adhesive Anchoring System.
2. Drill and clean hole per manufactures recommendations using the Hilti Hollow Drill Bit system with continuously deformed rebar per ICC ESR-3187.
3. Embedment Dowels: Standard embedment per manufacturer. Bend dowels where required prior to installing.

2.14 CAVITY-WALL INSULATION

A. Extruded-Polystyrene Board Insulation:

1. Refer to Section 072100 "Thermal Insulation" for miscellaneous rigid insulation installed under this Section. Refer to details for application of rigid insulation:
  - a. Below base flashing.
  - b. At starter course just above flashing at board product air barrier.
  - c. At stud backup with fluid applied air barrier.
  - d. At roof connection.

B. Foam Sealant: polyurethane-based insulating foam sealant;

1. Products: Subject to compliance with requirements, provide the following:
  - a. Dow; Great Stuff Pro Series, Gaps & Cracks (Pro Gun 24 oz. Canister).

C. Refer to Details for application of Section 072100 "Thermal Insulation".

2.15 MINERAL WOOL INSULATION (ROCK WOOL INSL.)

A. Unfaced, Rigid Glass Mineral Wool Board Insulation: ASTM C 612, Type IVB; with maximum flame spread and smoke developed indexes of 0 and 0, respectively, per UL 723 Certification, passing ASTM E 136 for non-combustion characteristics.

1. Nominal density of inner layer 4.1 lb/cu. ft. and of outer layer 6.2 lb/cu. ft.
2. Thermal resistivity of 4.3 hr.sq.ft.F/Btu.
3. Thickness: As required behind loose steel lintels.
4. Width: 16 inches
5. Basis-of-Design Product: Subject to compliance with requirements, provide the following or approved equal:
  - a. Roxul Inc; Cavity Rock DD.

- b. Thermafiber, Inc.; an Owens Corning company/

## 2.16 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Diedrich Technologies, Inc.; a division of Sandell Construction Solutions.
    - b. EaCo Chem, Inc.
    - c. PROSOCO, Inc.
  - 2. Products: Subject to compliance with requirements, provide the following:
    - a. Brick: Vana Trol.

## 2.17 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 2. Use portland cement-lime mortar unless otherwise indicated.
  - 3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
  - 1. For brick veneer, use Type N.
  - 2. For masonry below base flashing, use Type S:
    - a. Proportions: 1/2 part lime per part of Portland cement (94# cement: 20# lime).
    - b. 3000# Batch: P = 597#; L = 126#; S = 2,277#
  - 3. For masonry above base flashing, use Type N:

- a. Proportions: 1-1/4 parts lime per part of Portland cement (94# cement: 50# lime
- b. 3000# Batch: P = 413#; L = 219#; S = 2,368#

D. Grout for Unit Masonry: Comply with ASTM C476.

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Proportion grout in accordance with ASTM C476, paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2,500 psi.
3. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C143/C143M, except for self-consolidating grout complying with ASTM C 476.
  - a. Lifts 5'-4" or Less: 10 inches +/- 1 inch at time of placement.
  - b. Lifts Greater than 5'-4": 10 inches to 11 inches at time of placement.
  - c. Self-consolidating grout, transit mix or preblended bagged mix (silo or 80-pound bag).
    - 1) Mix grout to a slump flow of 24 to 30 inches.
  - d. Visual Stability Index of not greater than 1.
4. Preblended, Dry Grout Mix: Furnish dry grout ingredients in the form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
5. Documentation:
  - a. Ready-mixed Grout: Provide computerized batch tickets with each truck.
  - b. Preblended Grout: Provide with certification from manufacture on each shipment.
6. Applications:
  - a. Partially Grouted Masonry: Use grout that complies with requirements.
  - b. Fully Grouted Masonry: Use self-consolidating grout at brick piers (5/S1) and below base flashing.

2.18 SOURCE QUALITY CONTROL

- A. Owner will engage a qualified independent testing agency to perform source quality-control testing indicated below:
  1. Payment for these services will be made by Owner.
  2. Retesting of materials failing to comply with specified requirements shall be done at Contractor's expense.
- B. Concrete Masonry Unit Test: For each type of unit furnished, per ASTM C 140.



## 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 foundations are within tolerances specified.
  - 3. Verify that reinforcing dowels are properly placed.
  - 4. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested according to ASTM C67. Allow units to absorb water so they are damp but not wet at time of laying.

### 3.3 TOLERANCES

- A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch (12 mm) or minus 1/4 inch (6 mm).
2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch (12 mm).
3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet (3 mm in 3 m), 1/4 inch in 20 feet (6 mm in 6 m), or 1/2-inch (12-mm) maximum.
5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet (6 mm in 3 m), 3/8 inch in 20 feet (9 mm in 6 m), or 1/2-inch (12-mm) maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), or 1/2-inch (12-mm) maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch (1.5 mm) except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm).
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch (9 mm) or minus 1/4 inch (6 mm).
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch (1.5 mm) from one masonry unit to the next.

### 3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.
- G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- H. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.

### 3.5 MORTAR BEDDING AND JOINTING

- A. Lay CMUs as follows:
  - 1. Bed face shells in mortar and make head joints of depth equal to bed joints.
  - 2. Bed webs in mortar in all courses of piers, columns, and pilasters.
  - 3. Bed webs in mortar in grouted masonry, including starting course on footings.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
  - 1. Clean soiled surfaces with fiber brush and soap powder and rinse thoroughly with clear water.
  - 2. Allow cleaned surfaces to dry before setting.
  - 3. Wet joint surfaces thoroughly before applying mortar.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.
- D. Cut joints flush where indicated to receive cavity wall insulation and air barriers unless otherwise indicated.

### 3.6 CAVITY WALLS

- A. Bond wythes of cavity walls together using bonding system indicated on Drawings.
- B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
- C. Installing Cavity-Wall Insulation:
  - 1. Rigid Insulation
    - a. Below Base Flashing:
      - 1) Install anchors over moisture barrier.
      - 2) Push rigid insulation over anchors to hold it in place prior to laying veneer.
    - b. At starter course just above flashing at board product air barrier
      - 1) Cut strip to fit size of first course gap above mortar wash.
      - 2) Foam seal top joint.
    - c. At stud backup with fluid applied air barrier
      - 1) Install 10.5-inch strip of insulation above flashing.
      - 2) Install anchors to stud backup on top of insulation.
      - 3) Install next strip of insulation and anchors till top of panel.
      - 4) At Contractor's option, larger sections of insulation can be installed by pushing installed anchors through face of insulation board.
      - 5) Foam all joints for continuous insulation.
    - d. At roof connection
      - 1) Install anchors to existing CMU backup.
      - 2) Push rigid insulation over anchors to hold it in place prior to laying veneer.
      - 3) At Contractor's option, cut out rectangle in insulation to post install anchors.
  - D. Install mineral-wool insulation in cavities formed by lintels according to the following requirements:
    - 1. Use insulation widths and lengths that fill the cavities behind lintels. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.

### 3.7 MASONRY-JOINT REINFORCEMENT

- A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.
  2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
  3. Provide reinforcement not more than 8 inches (203 mm) above and below wall openings and extending 12 inches (305 mm) beyond openings in addition to continuous reinforcement.
- B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
- C. Provide continuity at wall intersections by using prefabricated T-shaped units.
- D. Provide continuity at corners by using prefabricated L-shaped units.
- E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

### 3.8 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
1. Provide an open space not less than 1 inch (25 mm) wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
  2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
  3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

### 3.9 ANCHORING MASONRY TO STRUCTURAL MEMBERS

- A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar and other rigid materials.
  2. Anchor masonry to structural members with anchors embedded in masonry joints and attached to structure as detailed.
  3. Space anchors as indicated, but not more than 16 inches o.c. horizontally or vertically.

### 3.10 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers to wall framing, concrete backup, and masonry backup with masonry-veneer anchors to comply with the following requirements:

1. Fasten screw-attached anchors through insulation to wall framing, and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed tie sections in masonry joints. Provide not less than 2 inches (50 mm) of air space between back of masonry veneer and face of sheathing.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
  - a. Align anchors with CMU webs whenever possible.
  - b. Provide anchors 8 inches from opening jambs.
  - c. Provide anchors a maximum of 12 inches above the horizontal leg of flashing.
  - d. Provide anchors within 8 inches of the top of wall.
  - e. Provide sufficient anchors to support rigid insulation (Section 072100 "Thermal Insulation").
4. Space anchors as indicated, but not more than 24 inches o.c. vertically and 32 inches o.c. horizontally, with not less than 1 anchor for each 2.67 sq. ft. of wall area.
5. Additional Anchors:
  - a. Provide additional fastener-attached anchors within 8 inches each side of openings, expansion joints, corners and similar conditions.
  - b. Provide additional fastener-attached anchors within 12 inches above horizontal leg of flashing at base flashing and lintel flashing.
  - c. Provide additional fastener-attached anchors one course below base flashing to hold veneer wythe below flashing during grouting, space at 24 inches on center horizontally maximum.
  - d. Provide additional fastener-attached anchors where anchor spacing exceeds maximum wall area permitted per anchor or maximum anchor spacing is exceeded.

### 3.11 CONTROL AND EXPANSION JOINTS

- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry as follows:
  1. Provide continuous 3/8-inch vertical joint without full face shell bedding.
  2. Provide joint relatively free of mortar. Remove mortar as required to allow for sealant joint to be installed.
  3. Stop reinforcing 2 inches each side of control joint, unless otherwise required.
- C. Form expansion joints in brick as follows:
  1. Build in compressible joint fillers in joints to keep free of mortar.
    - a. Set compressible filler back 1 inch from face of brick to allow for sealant joint to be installed.

- b. Below base flashing, install compressible filler across cavity to prevent grout from being continuous behind the joint.
2. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

### 3.12 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels.
- C. Provide minimum bearing of 8 inches (200 mm) at each jamb unless otherwise indicated.

### 3.13 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
  1. Base Flashing:
    - a. Grout cavity behind base veneer. Hold grout below top of brick to form key for mortar wash.
    - b. Form mortar wash starting at back of brick and slope upward 1/2 inch at CMU backup wall.
    - c. Fill core holes in first veneer course below flashing the day before installing flashing.
  2. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing.
  3. Prime surface substrate.
  4. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
  5. At masonry-veneer walls, extend flashing through veneer, across airspace and through insulation behind veneer, and up face of sheathing at least 16 inches or a minimum of 6 inches above top of cavity drainage material, whichever is greater.
  6. At lintels, extend flashing a minimum of 8 inches into masonry at each end. At heads and sills, extend flashing 6 inches (150 mm) at ends and turn up not less than 2 inches (50 mm) to form end dams.
  7. Install metal drip edges with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.

8. At base of wall conditions, stop flexible flashing 1/2 inch to 5/8 inch back from outside face of veneer and bond to top of veneer substrates with bonding adhesives recommended by flexible flashing manufacturer.
  9. Terminate Rubberized Asphalt Sheet Flashing 1/2 to 3/4 inch back of face of masonry at all exterior locations indicated.
  10. Position flashing against substrate, press firmly into place with steel hand roller, fully adhering to substrate. Lap splices 6 inches and roll. Seal edges, cuts and penetrations with mastic recommended by manufacture of flashing.
  11. Field fabricate or install preformed manufactured external and internal corners and end dams to ensure continuity and integrity of flashings. At expansion joints turn end dam up and fold into next higher bed joint, 3/4 inch.
- C. Install termination bar where shown with fasteners at 8 inches o.c. and seal top of termination bar.
- D. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.
- E. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- F. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
1. Use specified weep/cavity vent products to form weep holes.
  2. Space weep holes 24 inches (600 mm) o.c. unless otherwise indicated.
  3. Locate front edge of weep flush with exterior face of masonry.
  4. Clogged weep shall be removed and replaced.
- G. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material in "Miscellaneous Masonry Accessories" Article.

### 3.14 MOISTURE BARRIER

- A. Prepare concrete and masonry surfaces so they are smooth and free from projections that could puncture moisture barrier.
- B. Prime substrate, then install moisture barrier.
- C. Roll entire surface then seal all lap seams with mastic.
- D. Schedule work so moisture barrier is not exposed to UV more than 30 days or protect from UV.



### 3.15 REINFORCED UNIT MASONRY

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
  - 1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
  - 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and that of other loads that may be placed on them during construction.
- B. Placing Reinforcement:
  - 1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6.
  - 2. Lap reinforcing 48 bar diameters, unless noted otherwise.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
  - 1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6 for cleanouts and for grout placement, consolidation and reconsolidation, including minimum grout space and maximum pour height. Do not reconsolidate self-consolidating grout.
  - 2. Limit height of vertical grout pours to not more than 64 inches unless masonry has cured for at least 4 hours, grout slump is maintained between 10 and 11 inches, and no intermediate reinforcing bond beams are placed between the top and bottom of the pour height.
  - 3. Grout masonry no sooner than the following morning to avoid damaging the new wall.

### 3.16 FIELD QUALITY CONTROL

- A. Inspecting: Owner will engage special inspectors to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform inspections.
- B. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports:
  - 1. Payment for these services will be made by Owner.
  - 2. Retesting of materials failing to comply with specified requirements shall be done at Contractor's expense.
- C. Inspections: Special inspections according to Chapter 17 of the "2012 International Building Code".
  - 1. Begin masonry construction only after inspectors have verified preblended mortar.
  - 2. Place grout only after inspectors have verified compliance of grout spaces and of grades, sizes, and locations of reinforcement.

3. Preblended Grout: Verify bag is the approved mix with certification from manufacturer on each shipment.
  4. Ready-mix Grout: Verify grout mix with computerized batch ticket with each truck.
- D. Testing Frequency: One set of compressive strength tests for each 5000 sq. ft. (464 sq. m) of wall area or portion thereof.
- E. Clay Masonry Unit Test: For each type of unit provided, according to ASTM C67 for compressive strength.
- F. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C140 for compressive strength.
- G. Grout Test:
1. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.
  2. Compressive Strength: For each mix provided, according to ASTM C 1019.
  3. Slump/Flow: Verify each batch.
    - a. Slump: 8 to 11 inches, according to ASTM C 143/C 143M.
    - b. Self-consolidating Grout:
      - 1) Slump Flow: 24 to 30 inches, according to ASTM C 1611.
      - 2) Visual Stability Index: Not greater than 1 as determined by Appendix X1 of ASTM C 1611.
- H. Masonry Consultant: The Owner will employ a Masonry Consultant to perform evaluations of masonry construction and board product air barrier.
1. Lay masonry on flashing only after air barrier and flashing have been inspected by Masonry Consultant/Architect/Owner's Representative and accepted.
  2. Schedule inspections 24 hours in advance.
  3. Periodic masonry observation by the Owner's Masonry Consultant will be required at appropriate intervals during construction as masonry progresses. At a minimum, the following inspections shall be conducted.
    - a. All backup-wall board product air barrier applications shall be reviewed and accepted, in writing, by Owner's representative, or other qualified individual, to ensure that the application is complete, properly adhered, and openings other problems that will allow moisture to penetrate through to the substrate.
    - b. All flashing systems and moisture barriers shall be reviewed and accepted, in writing, by Owner's Masonry Consultant or other qualified individual, to ensure that the application is complete, and properly attached
  4. Provide access for Owner's Masonry Consultant as required to observe the Work

### 3.17 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance.
  - 1. During cleaning process rake joints to a uniform depth of 3/4-inch. Remove mortar from masonry surfaces within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum, and flush joints to remove dirt and loose debris.
  - 2. Do not spall edges of masonry units or widen joints. Replace or patch damaged masonry units as directed by Architect.
  - 3. Rinse joint surfaces with water to remove all dust and mortar particles. Time rinsing application so, at time of pointing, joint surfaces are damp but free of standing water. If rinse water dries, dampen joint surfaces before pointing.
  - 4. Mixing Pointing Mortar:
    - a. Mix materials in a clean, mechanical batch mixer.
    - b. Add only enough water to preblended mortar mix to produce a damp, unworkable mix that will retain its form when pressed into a ball.
    - c. Maintain mortar in this dampened condition for 15 to 30 minutes.
    - d. Add remaining water in small portions until mortar reaches desired consistency.
    - e. Use mortar within one hour of final mixing; do not retemper or use partially hardened material.
  - 5. Point all joints by placing mortar in layers not greater than 3/8 inch. Fully compact each layer and allow mortar to become almost thumbprint hard before applying next layer. Take care not to spread mortar beyond joint edges onto exposed masonry surfaces or to featheredge the mortar.
  - 6. When mortar is thumbprint hard, tool joints to match original appearance of joints as demonstrated in approved mockup. Remove excess mortar from edge of joint by brushing.
  - 7. Cure mortar by maintaining in thoroughly damp condition for at least 72 consecutive hours including weekends and holidays.
    - a. Acceptable curing methods include covering with wet burlap and plastic sheeting, periodic hand misting, and periodic mist spraying using system of pipes, mist heads, and timers.
    - b. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
  - 8. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint
- C. Prepare joints for sealant application, where indicated.

- D. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- E. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  - 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
  - 4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
  - 5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  - 6. Clean masonry with a proprietary cleaning method applied according to manufacturer's written instructions.
  - 7. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

### 3.18 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

## SECTION 051200 – STRUCTURAL STEEL FRAMING

### 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. Structural steel.
  - 2. Grout.

- B. Related Sections:

- 1. Division 01 Sections for independent testing agency procedures and administrative requirements.
  - 2. Section 053100 "Steel Decking" for field installation of shear connectors through deck.
  - 3. Section 055000 "Metal Fabrications" for miscellaneous steel fabrications and other metal items not defined as structural steel.
  - 4. Section 055100 "Metal Stairs."

#### 1.3 DEFINITIONS

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

- B. Heavy Sections: Rolled and built-up sections as follows:

- 1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches (38 mm).
  - 2. Welded built-up members with plates thicker than 2 inches (50 mm).
  - 3. Column base plates thicker than 2 inches (50 mm).

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator, including comprehensive engineering design by a qualified professional engineer licensed in the state which the project is located, to withstand loads indicated and comply with other information and restrictions indicated.

- 1. Select and complete connections using schematic details indicated and AISC 360.

2. Use LRFD; data are given at factored-load level.
3. For beams where no factored shear reaction is indicated, design connections to sustain one half the maximum uniform load for span length indicated in AISC 360, Table 3-6.

B. Moment Connections: Type FR, fully restrained.

C. Construction: As indicated.

## 1.5 SUBMITTALS

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

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
5. For structural-steel connections indicated to comply with design loads, include structural design data signed and sealed by the qualified professional engineer, licensed in the state in which the project is located, responsible for their preparation.
  - a. Calculations must be submitted with the shop drawings for review.
  - b. Indicate all applicable piece marks on calculations sheets.
  - c. Design simple shear connections for maximum factored reaction indicated. If no reaction has been indicated, design simple shear connections to withstand one-half the maximum uniform load for the given beam span noted in the AISC Steel Construction Manual Table.
  - d. Design moment connections for factored reactions indicated. If no reaction is provided, design the moment connection for the maximum available moment capacity of the smaller beam member framing into the joint.
  - e. Design axial loaded members of trusses and bracing for the factored reactions indicated. If no reaction is indicated, design the member for the maximum tension and compression forces available to the member based on size and length. All bolted connection design shall account for net area reduction of the members.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint whether prequalified or qualified by testing, including the following:

1. Power source (constant current or constant voltage).
2. Electrode manufacturer and trade name, for demand critical welds.

D. Qualification Data: For qualified Installer, fabricator, professional engineer, and testing agency.

1. Qualification Data must be submitted to Engineer prior to commencing work.
- E. Welding certificates.
- F. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- G. Mill test reports for structural steel, including chemical and physical properties.
- H. Product Test Reports: For the following:
  1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  2. Direct-tension indicators.
  3. Tension-control, high-strength bolt-nut-washer assemblies.
  4. Shear stud connectors.
  5. Shop primers.
  6. Nonshrink grout.
- I. Source quality-control reports.

#### 1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
  1. As an exception, non-AISC certified fabricators will be accepted provided the fabricator includes in their bid the services of the owner's special inspection and testing agency to provide inspection/testing services for in-shop work to meet the requirements of IBC Section 1704 and any additional requirements noted in the construction documents. Final costs of these services will be as required by the owner's special inspection and testing agency, which may or may not be hired at the time of bidding the project. It will be the fabricator's responsibility for estimating these costs. Cost will be withheld from the fabricator to pay for these services. Refer to IBC Section 1705 for verification and inspection requirements.
  2. All inspection costs incurred by the Owner's inspection and testing agency for this exception will be tracked and invoiced to the owner independently of other special inspection costs to allow withholding from the relevant contractor's regular payments.
- B. Installer Qualifications: Engage an experienced Installer who has completed structural steel work similar in material, design and extent to that indicated for this Project and with a record of continuous successful in-service performance for a minimum of 5 years. Installer shall provide a list of projects completed within the last 5 years and shall include the names of the Architect, Engineer and General Contractor with contact information for each.
- C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- D. Comply with applicable provisions of the following specifications and documents:
  1. AISC 303.
  2. AISC 341 and AISC 341s1.
  3. AISC 360.
  4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- E. Preinstallation Conference: Conduct conference at Project site.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
  1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
- C. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
- D. Clean and relubricate bolts and nuts that become dry or rusty before use.
- E. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

#### 1.8 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.



## PART 2 - PRODUCTS

### 2.1 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A 992/A 992M.
- B. Channels, Angles, S-Shapes: ASTM A 36/A 36M.
- C. Plate and Bar: ASTM A 36/A 36M, unless otherwise indicated on Drawings.
- D. Plate and Bar for Plate Girders: ASTM A 992 (Grade 50). ASTM A 572, Grade 50 is an acceptable substitute.
- E. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
- F. Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
  - 1. Weight Class: Standard, unless otherwise indicated.
  - 2. Finish: Black except where indicated to be galvanized.
- G. Steel Castings: ASTM A 216/A 216M, Grade WCB with supplementary requirement S11.
- H. Steel Forgings: ASTM A 668/A 668M.
- I. Welding Electrodes: Comply with AWS requirements.

### 2.2 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers; all with plain finish.
  - 1. Direct-Tension Indicators: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8), compressible-washer type with plain finish.
- B. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
  - 1. Finish: Plain.
- C. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- D. Headed Anchor Rods: ASTM F 1554, Grade 55, weldable, straight.
  - 1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.

2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
4. Finish: Plain.

E. Threaded Rods: ASTM A 36/A 36M.

1. Nuts: ASTM A 563 (ASTM A 563M) heavy-hex carbon steel.
2. Washers: ASTM F 436 (ASTM F 436M), Type 1, hardened carbon steel.
3. Finish: Plain, unless otherwise indicated.

F. Clevises and Turnbuckles: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1035.

G. Eye Bolts and Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1030.

H. Sleeve Nuts: Made from cold-finished carbon steel bars, ASTM A 108, Grade 1018.

## 2.3 PRIMER

- A. Primer: Fabricator's standard gray color, lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
- B. Galvanizing Repair Paint: ASTM A 780.

## 2.4 GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.5 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
  1. Camber structural-steel members where indicated.
  2. Fabricate beams with rolling camber up.
  3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
  4. Mark and match-mark materials for field assembly.
  5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1, "Solvent Cleaning" and at architecturally exposed steel SSPC SP 3, "Power Tool Cleaning."
- F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
  1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
  2. Baseplate Holes: Cut, drill, or punch holes perpendicular to steel surfaces.
  3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

## 2.6 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  1. Joint Type: Snug tightened, unless otherwise indicated.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

## 2.7 SHOP PRIMING

- A. 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 (50 mm).
  2. Surfaces to be field welded.
  3. Surfaces to be high-strength bolted with slip-critical connections.
  4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
  5. Galvanized surfaces.

- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
  - 1. SSPC-SP 2, "Hand Tool Cleaning."
  - 2. SSPC-SP 3, "Power Tool Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
  - 1. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

## 2.8 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
  - 1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
  - 2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls. Galvanize all structural steel not located in conditioned space in the final construction.

## 2.9 SOURCE QUALITY CONTROL

- A. This article is not applicable if fabricator is an "approved fabricator" by the Jurisdiction Having Authority in accordance with the building code. All shop testing and inspections costs incurred by the Owner's inspection and testing agency will be made payable by the fabricator. See Drawing Sheet S0.1 for further information and requirements. Submit approval certification to Architect/Engineer prior to commencing work.
- B. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
  - 1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- C. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- D. Bolted Connections: Shop-bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

- E. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
1. Liquid Penetrant Inspection: ASTM E 165.
  2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
  3. Ultrasonic Inspection: ASTM E 164.
    - a. Test all Complete Joint Penetration (CJP) welds.
  4. Radiographic Inspection: ASTM E 94.
- F. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
1. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

### 3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Base Bearing and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Snug tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
  - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

### 3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug-tightened.

- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  - 2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
  - 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

### 3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.
- B. Bolted Connections: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
  - 1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
    - a. Liquid Penetrant Inspection: ASTM E 165.
    - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
    - c. Ultrasonic Inspection: ASTM E 164.
      - 1) Test all Complete Joint Penetration (CJP) welds.
    - d. Radiographic Inspection: ASTM E 94.
  - 2. Ultrasonic Inspection shall be performed on all complete joint penetration welds and other welds indicated.
- D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
  - 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  - 2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

### 3.6 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

END OF SECTION 051200



## SECTION 054000 - COLD-FORMED METAL FRAMING

### 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. This Section includes cold-formed metal framing (CFMF) as follows:
  - 1. Exterior non-load-bearing wall framing.
  - 2. Exterior soffit framing.
  - 3. Interior non-load-bearing wall framing supporting ceiling joists.
  - 4. Ceiling joist framing.
- B. Related Sections include the following:
  - 1. Section 055000 "Metal Fabrications" for masonry shelf angles.
  - 2. Section 092216 "Non-Structural Metal Framing" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.

#### 1.3 SUBMITTALS

- A. Product Data: For each type of cold-formed metal framing product and accessory indicated.
- B. Welding certificates.
- C. Research/Evaluation Reports:
  - 1. For cold-formed metal framing.
  - 2. Vertical deflection clips.
  - 3. Miscellaneous structural clips and accessories.
  - 4. Power-actuated anchors.
- D. Shop Drawings:
  - 1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
  - 2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

- E. Delegated Design Submittal: For cold-formed steel framing.

#### 1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated.
- B. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and metallic-coating thickness.
- C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- D. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.
- B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

#### 1.6 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, licensed to practice in the State of Missouri, to design cold-formed steel framing.
- B. Structural Performance: Provide cold-formed steel framing capable of withstanding design loads within limits and under conditions indicated.
  - 1. Design Loads: As indicated on the Drawings.
  - 2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
    - a. Exterior Non-Load Bearing Framing: Horizontal deflection of 1/600 of the wall height.
    - b. Ceiling Joist Framing: Vertical deflection of 1/360 of the span for live loads and 1/240 for total loads of the span.
    - c. Interior Non-load Bearing Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft. (239 Pa).

3. Design framing systems to provide for movement of framing members located outside the insulated building envelope without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F (67 deg C).
  4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
    - a. Upward and downward movement of 1 inch (25 mm).
  5. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.
- C. Cold-Formed Steel Framing Design Standards:
1. Floor and Roof Systems: AISI S210.
  2. Wall Studs: AISI S211.
  3. Headers: AISI S212.
  4. Lateral Design: AISI S213.
- D. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.
- E. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- F. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AllSteel & Gypsum Products, Inc.
  2. California Expanded Metal Products Company.
  3. ClarkWestern Building Systems, Inc.
  4. Consolidated Fabricators Corp.; Building Products Division.
  5. Craco Mfg., Inc.
  6. Custom Stud Inc.
  7. Design Shapes in Steel.
  8. Dietrich Metal Framing; a Worthington Industries Company.
  9. Formetal Co. Inc. (The).
  10. MarinoWARE.
  11. Nuconsteel; a Nucor Company.

12. Olmar Supply, Inc.
13. Quail Run Building Materials, Inc.
14. SCAFCO Corporation.
15. Southeastern Stud & Components, Inc.
16. State Building Products, Inc.
17. Steel Construction Systems.
18. Steel Network, Inc. (The).
19. Steel Structural Systems.
20. Steeler, Inc.
21. Super Stud Building Products, Inc.
22. Telling Industries, LLC.
23. United Metal Products, Inc.
24. United Steel Manufacturing.

## 2.2 MATERIALS

- A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
1. Grade: ST33H (ST230H) for thicknesses less than 0.05-inches, ST50H (ST340H) for other thicknesses.
  2. Coating: G60 (Z180), A60 (ZF180) or AZ50 (AZ150).
- B. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 50 (340), Class 1 or 2.
  2. Coating: G90 (Z275).

## 2.3 EXTERIOR AND INTERIOR NON-LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm) for exterior framing and as required per performance requirements for interior framing.
  2. Minimum Flange Width: 1-5/8 inches (41 mm).
- B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: Matching steel studs.
  2. Flange Width: 1-1/4 inches (32 mm).
- C. Vertical Deflection Clips: Manufacturer's standard bypass and head clips, capable of accommodating upward and downward vertical displacement of primary structure through positive mechanical attachment to stud web. Mechanical attachment to structure and screw

attachment to stud web using step-bushings to permit frictionless vertical movement; 68 mils (1.72 mm) minimum thickness size as required by structural design calculations.

1. Basis-of-Design Product: Subject to compliance with requirements, provide The Steel Network, Inc.; Verticlip™ including step bushings.
  - a. Exterior Head of Wall: The Steel Network, Inc.; Verticlip™ SL.
  - b. Exterior Head of Wall Preassembled with Track: The Steel Network, Inc.; Verticlip™ VTX.
  - c. By-pass Structural Pour Stop at Floor Slab: The Steel Network, Inc.; VertiClip™ SLB.
  - d. By-pass Floor Slab or Structure: The Steel Network, Inc.; VertiClip™ SLT.
  - e. By-pass Structure: The Steel Network, Inc.; VertiClip™ SLS.
- D. Rigid Clip Angles: Manufacturer's standard rigid clip for attachment to structure and stud web.
  1. Basis-of-Design Product: Subject to compliance with requirements, provide The Steel Network, Inc.; StiffClip™ CL.
- E. Single Deflection Track at Interior Walls: Manufacturer's single, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
  1. Minimum Base-Metal Thickness: Match studs.
  2. Flange Width: 1 inch (25 mm) plus the design gap for one-story structures and 1 inch (25 mm) plus twice the design gap for other applications.
- F. Double Deflection Tracks (Contractor's Option at Interior Walls): Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
  1. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal loads and transfer them to the primary structure, and as follows:
    - a. Minimum Base-Metal Thickness: Match studs.
    - b. Flange Width: 1 inch (25 mm) plus the design gap for one-story structures and 1 inch (25 mm) plus twice the design gap for other applications.
  2. Inner Track: Of web depth indicated, and as follows:
    - a. Minimum Base-Metal Thickness: Match studs.
    - b. Flange Width: Insert dimension equal to sum of outer deflection track flange width plus 1 inch (25 mm).

## 2.4 CEILING JOIST FRAMING

- A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0329 inch (0.84 mm).
  2. Flange Width: 1-5/8 inches (41 mm), minimum.
  3. Section Properties: As required for loads indicated.

## 2.5 SOFFIT FRAMING

- A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:
1. Minimum Base-Metal Thickness: 0.0538 inch (1.37 mm).
  2. Flange Width: 1-5/8 inches (41 mm), minimum.

## 2.6 FRAMING ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
1. Supplementary framing.
  2. Bracing, bridging, and solid blocking.
  3. Web stiffeners.
  4. Anchor clips.
  5. End clips.
  6. Foundation clips.
  7. Gusset plates.
  8. Stud kickers, knee braces, and girts.
  9. Joist hangers and end closures.
  10. Hole reinforcing plates.
  11. Backer plates.

## 2.7 ANCHORS, CLIPS, AND FASTENERS

- A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.
- B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.
- E. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
  - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

## 2.8 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: ASTM A 780.
- B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107, with fluid consistency and 30-minute working time.
- D. Shims: Load bearing, high-density multimonomer plastic, nonleaching.
- E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

## 2.9 FABRICATION

- A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
  - 1. Fabricate framing assemblies using jigs or templates.
  - 2. Cut framing members by sawing or shearing; do not torch cut.
  - 3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.

- a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
  - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
  1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
  2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
  1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION, GENERAL

- A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
  1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).



- D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.
  - 1. Cut framing members by sawing or shearing; do not torch cut.
  - 2. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
    - a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- H. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
- J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
  - 1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

### 3.3 EXTERIOR AND INTERIOR NON-LOAD-BEARING WALL INSTALLATION

- A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
- B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:
  - 1. Stud Spacing: 16 inches (406 mm) unless indicated otherwise or other spacing required for interior wall framing.
  - 2. At Wall Type B5: 12 inches (304.5 mm).

- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.
- D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
  - 1. Connect vertical deflection clips to bypassing and infill studs and anchor to building structure.
  - 2. Connect drift clips to cold formed metal framing and anchor to building structure.
- E. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.
  - 1. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
  - 2. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.

### 3.4 INSTALLATION OF JOIST FRAMING

- A. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.
- B. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
  - 1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches (38 mm).
  - 2. Reinforce ends and bearing points of joists with web stiffeners, end clips, joist hangers, steel clip angles, or steel-stud sections.
- C. Space joists not more than 2 inches (51 mm) from abutting walls, and as follows:
  - 1. Joist Spacing: 16 inches (406 mm).
- D. Frame openings with built-up joist headers, consisting of joist and joist track or another combination of connected joists if indicated.
- E. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement.
  - 1. Install web stiffeners to transfer axial loads of walls above.

- F. Install bridging at intervals indicated on Shop Drawings. Fasten bridging at each joist intersection as follows:
  - 1. Joist-Track Solid Bridging: Joist-track solid blocking of width and thickness indicated, secured to joist webs.
  - 2. Combination Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and joist-track solid blocking of width and thickness indicated. Fasten flat straps to bottom flange of joists and secure solid blocking to joist webs.
- G. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.
- H. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

### 3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does 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.

### 3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000



## SECTION 055000 - METAL FABRICATIONS

### 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. Steel framing and supports for operable partitions.
2. Steel framing and supports for overhead doors and grilles.
3. Steel framing and supports for countertops.
4. Steel tube reinforcement for low partitions.
5. Steel framing and supports for mechanical and electrical equipment.
6. Steel framing and supports for applications where framing and supports are not specified in other Sections.
7. Elevator machine beams and hoist beams.
8. Shelf angles.
9. Metal ships' ladders and pipe crossovers.
10. Metal ladder for elevator pit.
11. Elevator pit sump covers.
12. Miscellaneous steel trim including steel angle corner guards steel edgings and loading-dock edge angles.
13. Metal bollards.
14. Utility trench frames and covers.
15. Screen wall gates.

- B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

- C. Related Requirements:

1. Section 033000 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
2. Section 042000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.

3. Section 051200 "Structural Steel Framing."
4. Section 055213 "Pipe and Tube Railings" for attached handrails.
5. Section 057300 "Decorative Metal Railings".
6. Section 076200 "Sheet Metal Flashing and Trim" for downspout adaptors to underground piping.

### 1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. 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. Deliver such items to Project site in time for installation.

### 1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
  1. Nonslip aggregates and nonslip-aggregate surface finishes.
  2. Paint products.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:
  1. Steel framing and supports for operable partitions.
  2. Steel framing and supports for overhead doors and grilles.
  3. Steel framing and supports for countertops.
  4. Steel tube reinforcement for low partitions.
  5. Steel framing and supports for mechanical and electrical equipment.
  6. Steel framing and supports for applications where framing and supports are not specified in other Sections.
  7. Elevator machine beams, hoist beams, and divider beams.
  8. Shelf angles.
  9. Metal ships' ladders and pipe crossovers.
  10. Metal ladders.
  11. Elevator pit sump covers.
  12. Miscellaneous steel trim including steel angle corner guards steel edgings and loading-dock edge angles.
  13. Metal bollards.
  14. Utility trench frames and covers.
- C. Samples for Verification: For each type and finish of extruded nosing and tread.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For professional engineer.
- B. Mill Certificates: Signed by stainless-steel manufacturers, certifying that products furnished comply with requirements.
- C. Welding certificates.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- E. Research/Evaluation Reports: For post-installed anchors, from ICC-ES.

## 1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
  - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

## 1.7 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

## PART 2 - PRODUCTS

### 2.1 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.
- D. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- E. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

## METAL FABRICATIONS

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- F. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- G. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.
- H. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
  - 1. Size of Channels: As indicated.
  - 2. Material: Galvanized steel, ASTM A 653/A 653M, structural steel, Grade 33 (Grade 230), with G90 (Z275) coating; 0.108-inch (2.8-mm) nominal thickness.
  - 3. Material: Cold-rolled steel, ASTM A 1008/A 1008M, structural steel, Grade 33 (Grade 230)]; 0.0966-inch (2.5-mm) minimum thickness; hot-dip galvanized after fabrication.
- I. Aluminum Plate and Sheet: ASTM B 209 (ASTM B 209M), Alloy 6061-T6.
- J. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063-T6.
- K. Aluminum-Alloy Rolled Tread Plate: ASTM B 632/B 632M, Alloy 6061-T6.
- L. Aluminum Castings: ASTM B 26/B 26M, Alloy 443.0-F.

## 2.2 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
  - 1. Provide stainless-steel fasteners for fastening stainless steel.
  - 2. Provide bronze fasteners for fastening bronze.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
- C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 325, Type 3 (ASTM A 325M, Type 3); with hex nuts, ASTM A 563, Grade C3 (ASTM A 563M, Class 8S3); and, where indicated, flat washers.
- D. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
  - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- E. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in



concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

- F. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F 2329.

## 2.3 MISCELLANEOUS MATERIALS

- A. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).

## 2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

## 2.5 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
  1. Fabricate units from slotted channel framing where indicated.
  2. Furnish inserts for units installed after concrete is placed.
- C. Fabricate supports for operable partitions from continuous steel beams of sizes indicated with attached bearing plates, anchors, and braces as recommended by partition manufacturer. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.
- D. Galvanize miscellaneous framing and supports where indicated.
- E. Prime miscellaneous framing and supports with zinc-rich primer where not indicated to be galvanized.

## 2.6 SHELF ANGLES

- A. Fabricate shelf angles from steel angles of sizes indicated and for attachment to concrete framing. Provide horizontally slotted holes to receive 3/4-inch (19-mm) bolts, spaced not more than 6 inches (150 mm) from ends and 24 inches (600 mm) o.c., unless otherwise indicated.
  - 1. Provide mitered and welded units at corners.
  - 2. Provide open joints in shelf angles at expansion and control joints. Make open joint approximately 2 inches (50 mm) larger than expansion or control joint.
- B. For cavity walls, provide vertical channel brackets to support angles from backup masonry and concrete.
- C. Galvanize and prime shelf angles located in exterior walls.
- D. Prime shelf angles located in exterior walls with zinc-rich primer.
- E. Furnish wedge-type concrete inserts, complete with fasteners, to attach shelf angles to cast-in-place concrete.

## 2.7 METAL SHIPS' LADDERS

- A. Provide metal ships' ladders and pipe crossovers where indicated. Fabricate of open-type construction with channel or plate stringers and pipe and tube railings unless otherwise indicated. Provide brackets and fittings for installation.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. O'Keefe's, Inc.; Platform and Return Model 522.
    - b. Precision Ladders, LLC.; Aluminum Crossover Ship's Stair.
  - 2. Treads shall be nominally 4-5 inches wide, including the nosing, and riser height shall be 9-1/2 – 12-inch equal spaces.
  - 3. Fabricate ships' ladders and pipe crossovers, including railings from aluminum.
  - 4. Fabricate treads from aluminum.
  - 5. Width: 24 inches.
  - 6. Angle: 65 degrees.

## 2.8 METAL LADDERS

- A. Steel Ladder at Elevator Pit:
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. IKG Industries, a Harsco company; Mebac.
    - b. W. S. Molnar Company; SlipNOT.

2. Siderails: Continuous, 3/8-by-2-1/2-inch (9.5-by-64-mm) steel flat bars, with eased edges.
3. Rungs: 3/4-inch- (19-mm-) diameter steel bars.
4. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
5. Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to rung by a proprietary process.
6. Shop prime interior ladders, including brackets and fasteners.

## 2.9 ELEVATOR PIT SUMP COVERS

- A. Fabricate from 3/16-inch (4.8-mm) abrasive-surface floor plate with four 1-inch- (25-mm-) diameter holes for water drainage and for lifting.
- B. Fabricate from welded or pressure-locked steel bar grating Limit openings in gratings to no more than 1/2 inch (12 mm) in least dimension.
- C. Provide steel angle supports as indicated.

## 2.10 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.
- B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.
  1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.
- C. Galvanize exterior miscellaneous steel trim.

## 2.11 METAL BOLLARDS

- A. Fabricate metal bollards from Schedule 40 steel pipe.
  1. Cap bollards with 1/4-inch- (6.4-mm-) thick steel plate.
- B. Fabricate bollards with 3/8-inch- (9.5-mm-) thick steel baseplates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch (19-mm) anchor bolts.
  1. Where bollards are to be anchored to sloping concrete slabs, angle baseplates for plumb alignment of bollards.

- C. Fabricate sleeves for bollard anchorage from steel pipe or tubing with 1/4-inch- (6.4-mm-) thick steel plate welded to bottom of sleeve. Make sleeves not less than 8 inches (200 mm) deep and 3/4 inch (19 mm) larger than OD of bollard.
- D. Fabricate internal sleeves for removable bollards from Schedule 40 steel pipe or 1/4-inch (6.4-mm) wall-thickness steel tubing with an OD approximately 1/16 inch (1.5 mm) less than ID of bollards. Match drill sleeve and bollard for 3/4-inch (19-mm) steel machine bolt.
- E. Galvanize bollards.
- F. Prime bollards with zinc-rich primer after galvanizing.

## 2.12 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches (200 mm) unless otherwise indicated.
- C. Galvanize and prime loose steel lintels located in exterior walls.
- D. Prime loose steel lintels located in exterior walls with zinc-rich primer.

## 2.13 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

## 2.14 UTILITY TRENCH FRAMES AND COVERS

- A. MM Systems "Linear Access Covers" or equal, with recessed top plate for flooring.

## 2.15 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

## 2.16 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize all exterior items to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
  - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.
- C. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
  - 1. Shop prime with primers specified in Section 099113 "Exterior Painting" unless indicated.
- D. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 3. Items Indicated to Receive Primers Specified in Section 099600 "High-Performance Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
  - 4. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- E. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
  - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

## 2.17 ALUMINUM FINISHES

- A. As-Fabricated Finish: AA-M12.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

### 3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.
- B. Anchor supports for operable partitions overhead doors and overhead grilles securely to, and rigidly brace from, building structure.

### 3.3 INSTALLING SHELF ANGLES

- A. Install shelf angles per drawings and as follows:
  - 1. Vertical Lines of Alignment (Plumb):
    - a. Locate toe of angle by surveying face of veneer prior to veneer installation.
    - b. Use full depth shims to adjust toe of angle horizontally outward when angle is more than 1 inch behind the face of brick.
    - c. Saw-cut off toe of shelf angle to adjust toe of angle horizontally where steel is beyond face of veneer.
  - 2. Horizontal Lines of Alignment (Elevation):
    - a. Locate shelf angles so top of angle is at the bottom of the brick course directly above the angle.

3. Tolerances:
  - a. Vertical: Do not vary from plumb more than:
    - 1) 1/8 inch in 10 feet.
    - 2) 1/4 inch in 20 feet.
    - 3) 1/2 inch maximum.
  - b. Horizontal: Do not vary from elevation more than:
    - 1) 1/8 inch in 10 feet.
    - 2) 1/4 inch in 20 feet.
    - 3) 1/2 inch maximum.
  - c. Offset: Do not exceed 1/8-inch offset between angles at butt joints.
4. Apply three (3) coats of cold-galvanizing repair paint to repair galvanizing at sawn edges.

### 3.4 INSTALLING METAL BOLLARDS

- A. Fill metal-capped bollards solidly with concrete and allow concrete to cure seven days before installing.
  1. Do not fill removable bollards with concrete.
- B. Anchor bollards to existing construction with through bolts. Provide four 3/4-inch (19-mm) bolts at each bollard unless otherwise indicated.
  1. Embed anchor bolts at least 4 inches (100 mm) in concrete.
- C. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches (75 mm) above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.
- D. Anchor internal sleeves for removable bollards in concrete by inserting in pipe sleeves preset into concrete. Fill annular space around internal sleeves solidly with nonshrink grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch (3 mm) toward internal sleeve.
- E. Anchor internal sleeves for removable bollards in place with concrete footings. Center and align sleeves in holes 3 inches (75 mm) above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace sleeves in position until concrete has cured.
- F. Place removable bollards over internal sleeves and secure with 3/4-inch (19-mm) machine bolts and nuts. After tightening nuts, drill holes in bolts for inserting padlocks. Owner furnishes padlocks.
- G. Fill bollards solidly with concrete, mounding top surface to shed water.



1. Do not fill removable bollards with concrete.

### 3.5 INSTALLING UTILITY TRENCH FRAMES AND COVERS

- A. Install utility trench frames and covers flush with finished flooring per manufacturer's instructions.

### 3.6 INSTALLING LADDERS

- A. Install ladders securely per manufacturer's instructions and referenced standards.

### 3.7 ADJUSTING AND CLEANING

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

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

### 3.8 Protection:

1. Protect installed products until final completion of project.
2. Touch-up, repair or replace damaged components before final completion.

END OF SECTION 055000



## SECTION 055113 - METAL PAN STAIRS

### 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. Preassembled steel stairs with concrete-filled treads.
- B. Related Requirements:
  - 1. Section 033000 "Cast-in-Place Concrete" for concrete fill for stair treads and platforms.

#### 1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for metal stairs. 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. Deliver such items to Project site in time for installation.
- C. Coordinate locations of hanger rods and struts with other work so that they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For metal pan stairs and the following:
  - 1. Prefilled metal-pan-stair treads.
  - 2. Paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

### 2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
  - 2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).
  - 3. Uniform and concentrated loads need not be assumed to act concurrently.
  - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
  - 5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch (6.4 mm), whichever is less.

### 2.3 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Steel Tubing: ASTM A 500 (cold formed) or ASTM A 513.
- D. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, either commercial steel, Type B, or structural steel, Grade 30 (Grade 205), unless another grade is required by design loads.

## METAL PAN STAIRS

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## 2.4 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
  - 1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for stairs indicated to be shop primed with zinc-rich primer.
- D. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
  - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.

## 2.5 MISCELLANEOUS MATERIALS

- A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
  - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

## 2.6 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, struts, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
  - 1. Join components by welding unless otherwise indicated.
  - 2. Use connections that maintain structural value of joined pieces.
- B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld connections to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Weld exposed corners and seams continuously unless otherwise indicated.
  - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 3 welds: partially dressed weld with spatter removed.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.

## 2.7 STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," Commercial Class, unless more stringent requirements are indicated.
- B. Stair Framing:
  - 1. Fabricate stringers of steel rectilinear tubing as detailed.
    - a. Provide closures for exposed ends of stringers.
  - 2. Construct platforms of steel plate or channel headers and miscellaneous framing members as needed to comply with performance requirements indicated.
  - 3. Weld stringers to headers; weld framing members to stringers and headers.
  - 4. Where stairs are enclosed by gypsum board shaft-wall assemblies, provide hanger rods or struts to support landings from floor construction above or below. Locate hanger rods and struts where they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.
- C. Metal Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements, but not less than 0.067 inch (1.7 mm).
  - 1. Steel Sheet: Uncoated hot-rolled steel sheet.
  - 2. Directly weld metal pans to stringers; locate welds on top of subtreads where they are concealed by concrete fill. Do not weld risers to stringers.
  - 3. Shape metal pans to include nosing integral with riser.
  - 4. At Contractor's option, provide stair assemblies with metal pan subtreads filled with reinforced concrete during fabrication.
  - 5. Provide subplatforms of configuration indicated or, if not indicated, the same as subtreads. Weld subplatforms to platform framing.

## METAL PAN STAIRS

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- a. Smooth Soffit Construction: Construct subplatforms with flat metal under surfaces to produce smooth soffits.

## 2.8 STAIR RAILINGS

- A. Comply with applicable requirements in Section 055213 "Pipe and Tube Railings" and Section 057300 "Decorative Metal Railings."
  1. Connect posts to stair framing by direct welding stair clips to metal pan stair as detailed.
- B. Steel Tube Railings: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.
  1. Rails and Posts: As detailed.
- C. Welded Connections: Fabricate railings with welded connections. Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
  1. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint as shown in NAAMM AMP 521.
- D. Form changes in direction of railings as follows:
  1. As detailed.
- E. Close exposed ends of railing members with prefabricated end fittings.
- F. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.
- G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
  1. For nongalvanized railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
  2. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch (38-mm) clearance from inside face of handrail to finished wall surface.

## 2.9 FINISHES

- A. Finish metal stairs after assembly.

- B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning."
- C. Apply shop primer to uncoated surfaces of metal stair components. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

## PART 3 - EXECUTION

### 3.1 INSTALLING METAL PAN STAIRS

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- F. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.
- G. Place and finish concrete fill for treads and platforms to comply with Section 033000 "Cast-in-Place Concrete."
  - 1. Install abrasive nosings with anchors fully embedded in concrete at Storm Shelter and Mechanical Penthouse stairs. Center nosings on tread width.

### 3.2 INSTALLING RAILINGS

- A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:
  - 1. Anchor posts to steel by welding or bolting to steel supporting members.



- B. Attach handrails to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as required to comply with performance requirements as follows:
1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
  2. For steel-framed partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.

### 3.3 ADJUSTING AND 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.
1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

END OF SECTION 055113



## SECTION 055119 - METAL GRATING STAIRS

### 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 industrial-type, straight-run stairs with steel-grating treads and railings attached to metal grating stairs.

#### 1.3 COORDINATION

- A. Coordinate installation of anchorages for metal stairs. 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. Deliver such items to Project site in time for installation.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For metal grating stairs and the following:
  - 1. Paint products.
  - 2. Grout.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments.
- C. Delegated-Design Submittal: For stairs, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stairs and railings.
- B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Uniform Live Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
  - 2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).
  - 3. Uniform and concentrated loads need not be assumed to act concurrently.
  - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
  - 5. Limit deflection of treads, platforms, and framing members to L/360.
  - 6. Wind: Design for the effects of wind load as determined according to ASCE/SEI 7. Refer to drawings for more information.
- C. Seismic Performance of Stairs: Metal stairs shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
  - 1. Component Importance Factor: 1.5.

### 2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.
- D. Steel Bars for Grating Treads: ASTM A 36/A 36M or steel strip, ASTM A 1011/A 1011M or ASTM A 1018/A 1018M.
- E. Wire Rod for Grating Crossbars: ASTM A 510 (ASTM A 510M).

## METAL GRATING STAIRS

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- F. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.
- G. Cast-Abrasive Nosings: Cast iron, with an integral abrasive, as-cast finish consisting of aluminum oxide, silicon carbide, or a combination of both.

## 2.3 FASTENERS

- A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
- C. Anchor Bolts: ASTM F 1554, Grade 36, of dimensions indicated; with nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
  - 1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for exterior stairs and stairs indicated to be galvanized.
- D. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
  - 1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

## 2.4 MISCELLANEOUS MATERIALS

- A. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

## 2.5 FABRICATION, GENERAL

- A. Provide complete stair assemblies, including metal framing, hangers, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.
  - 1. Join components by welding unless otherwise indicated.
  - 2. Use connections that maintain structural value of joined pieces.
- B. Form exposed work with accurate angles and surfaces and straight edges.
- C. Weld connections to comply with the following:
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove welding flux immediately.
  - 4. Weld exposed corners and seams continuously unless otherwise indicated.
  - 5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 4 welds: good quality, uniform undressed weld with minimal splatter.
- D. Fabricate joints that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

## 2.6 STEEL-FRAMED STAIRS

- A. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," Industrial Class, unless more stringent requirements are indicated.
- B. Stair Framing:
  - 1. Fabricate stringers of steel channels.
    - a. Provide closures for exposed ends of channel stringers.
  - 2. Construct platforms of steel channel headers and miscellaneous framing members as needed to comply with performance requirements.
  - 3. Weld stringers to headers; weld framing members to stringers and headers.
- C. Metal Bar-Grating Stairs: Form treads and platforms to configurations shown from metal bar grating; fabricate to comply with NAAMM MBG 531, "Metal Bar Grating Manual."
  - 1. Fabricate treads and platforms from welded steel grating with 1-by-3/16-inch (25-by-5-mm) bearing bars at 11/16 inch (17 mm) o.c. and crossbars at 4 inches (100 mm) o.c.
  - 2. Surface: Serrated.
  - 3. Finish: Galvanized.

4. Fabricate grating platforms with nosing matching that on grating treads. Provide toeplates at open-sided edges of grating platforms. Weld grating to platform framing.
5. All grating shall conform to ADA and not allow passage through by a 1/2-inch diameter sphere.

## 2.7 STAIR RAILINGS

- A. Comply with applicable requirements in Section 055213 "Pipe and Tube Railings."
  1. Connect posts to stair framing by direct welding unless otherwise indicated.

## 2.8 FINISHES

- A. Finish metal stairs after assembly.
- B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A 153/A 153M for steel and iron hardware and with ASTM A 123/A 123M for other steel and iron products.
  1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
  2. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.
- C. Field Welding: Comply with requirements for welding in "Fabrication, General" Article.

### 3.2 INSTALLING METAL STAIRS WITH GROUTED BASEPLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of baseplates.
- B. Set steel-stair baseplates on wedges, shims, or leveling nuts. After stairs have been positioned and aligned, tighten anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with edge of bearing plate before packing with grout.

## METAL GRATING STAIRS

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1. Use nonmetallic, nonshrink grout unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

### 3.3 ADJUSTING AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.

END OF SECTION 055119



## SECTION 055213 - PIPE AND TUBE RAILINGS

### 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. Steel pipe and tube railings.
- B. Related Requirements:
  - 1. Section 055112 "Metal Pan Stairs" for steel tube railings associated with metal pan stairs.
  - 2. Section 057300 "Decorative Metal Railings" for ornamental railings fabricated from pipes and tubes.

#### 1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for railings. 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. Deliver such items to Project site in time for installation.
- C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
  - 1. Manufacturer's product lines of mechanically connected railings.
  - 2. Railing brackets.
  - 3. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

- C. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.
- D. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

#### 1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

#### 1.8 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Handrails and Top Rails of Guards:
    - a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
    - b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.

#### PIPE AND TUBE RAILINGS

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2. Infill of Guards:

- a. Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
- b. Infill load and other loads need not be assumed to act concurrently.

B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C, material surfaces).

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
  1. Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch (38-mm) clearance from inside face of handrail to finished wall surface.

2.3 STEEL AND IRON

- A. Tubing: ASTM A 500 (cold formed) or ASTM A 513.
- B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
- C. Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.4 FASTENERS

- A. General: Provide the following:
  1. Ungalvanized-Steel Railings: Plated steel fasteners complying with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 for zinc coating.
  2. Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
  3. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Fasteners for Interconnecting Railing Components:
  - 1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
  - 2. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
- D. Post-Installed Anchors: Torque-controlled expansion anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.
  - 1. Material for Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.

## 2.5 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- D. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
  - 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- E. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

## 2.6 FABRICATION

- A. General: Fabricate 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. Shop assemble railings 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. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- F. Connections: Fabricate railings with either welded or nonwelded connections unless otherwise indicated.
- G. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
  - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  - 2. Obtain fusion without undercut or overlap.
  - 3. Remove flux immediately.
  - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- H. Form Changes in Direction as Follows:
  - 1. As detailed.
- I. Close exposed ends of railing members with prefabricated end fittings.
- J. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.
- K. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
- L. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

## 2.7 STEEL AND IRON FINISHES

### A. Galvanized Railings:

1. Hot-dip galvanize indicated steel railings, including hardware, after fabrication.
2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
4. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

### B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.

### C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

### D. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, galvanize anchors to be embedded in exterior concrete or masonry.

### E. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below:

1. Other Railings: SSPC-SP 3, "Power Tool Cleaning."

### F. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

1. Shop prime uncoated railings with universal shop primer unless
2. Do not apply primer to galvanized surfaces.

### G. High-Performance Coating: Apply epoxy intermediate and polyurethane topcoats to prime-coated surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Apply at spreading rates recommended by coating manufacturer.

1. Color: As selected by Architect from manufacturer's full range.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

#### A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

## PIPE AND TUBE RAILINGS

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### 3.2 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
  - 1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
  - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
  - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (6 mm in 3.5 m).
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
  - 1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

### 3.3 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.
- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- 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 (50 mm) beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches (150 mm) of post.

### 3.4 ANCHORING POSTS

- A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

### 3.5 ATTACHING RAILINGS

- A. Secure wall brackets and railing end flanges to building construction as follows:
1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
  2. For steel-framed partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
  3. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

### 3.6 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

### 3.7 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213



## SECTION 057300 - DECORATIVE METAL RAILINGS

### 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. Stainless-steel pipe handrails.
- B. Related Requirements:
  - 1. Section 055113 "Metal Pan Stairs" for decorative metal railings associated with metal pan stairs.

#### 1.3 DEFINITIONS

- A. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas and for pedestrian guidance and support, visual separation, or wall protection.

#### 1.4 COORDINATION AND SCHEDULING

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible.
- B. Coordinate installation of anchorages for railings. 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. Deliver items to Project site in time for installation.
- C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not meet structural performance requirements.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For the following:

1. Manufacturer's product lines of railings assembled from standard components.
2. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, and attachment details.

C. Samples for Initial Selection: For products involving selection of color, texture, or design, including mechanical finishes.

D. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

C. Welding certificates.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E894 and ASTM E935.

E. Evaluation Reports: For post-installed anchors, from ICC-ES.

#### 1.7 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
2. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

#### 1.8 FIELD 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.

### PART 2 - PRODUCTS

#### 2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

### DECORATIVE METAL RAILINGS

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- B. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
  - 1. Stainless Steel: 60 percent of minimum yield strength.
  - 2. Steel: 72 percent of minimum yield strength.
- C. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Handrails and Top Rails of Guards:
    - a. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
    - b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior railings by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
  - 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

## 2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.
  - 1. Provide formed-steel brackets with predrilled hole for bolted anchorage and with snap-on cover that matches rail finish and conceals bracket base and bolt head.

## 2.3 STAINLESS STEEL

- A. Pipe: ASTM A 312/A 312M, Grade TP 304.

## 2.4 STEEL AND IRON

- A. Plates, Shapes, and Bars: ASTM A36/A36M.

## 2.5 STAINLESS-STEEL FITTINGS AND FASTENERS

- A. General: Provide the following:

1. Stainless-Steel Components: Type 316 stainless-steel fasteners.
  2. Dissimilar Metals: Type 316 stainless-steel fasteners.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated in drawings and capable of withstanding design loads.
- C. Anchors: Provide torque-controlled expansion anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

## 2.6 FASTENERS

- A. Fastener Materials: Unless otherwise indicated, provide the following:
1. Uncoated Steel Components: Plated-steel fasteners complying with ASTM B633, Class Fe/Zn 25 for electrodeposited zinc coating where concealed; Type 304 stainless-steel fasteners where exposed.
- B. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work unless otherwise indicated, exposed fasteners are unavoidable, exposed fasteners are the standard fastening method for railings indicated.
1. Provide Phillips, tamper-resistant, square or hex socket flat-head machine screws for exposed fasteners unless otherwise indicated.
- D. Post-Installed Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308.
1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941 (ASTM F1941M), Class Fe/Zn 5, unless otherwise indicated.
  2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F593 (ASTM F738M), and nuts, ASTM F594 (ASTM F836M).

## 2.7 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

1. For aluminum railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.

- B. Shop Primers: Provide primers that comply with Section 099123 "Interior Painting."

## 2.8 FABRICATION

- A. General: Fabricate 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 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. Make up wire-rope assemblies in the shop to field-measured dimensions with fittings machine swaged. Minimize amount of turnbuckle take-up used for dimensional adjustment so maximum amount is available for tensioning wire ropes. Tag wire-rope assemblies and fittings to identify installation locations and orientations for coordinated installation.
- D. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- E. Form work true to line and level with accurate angles and surfaces.
- F. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate. Locate weep holes in inconspicuous locations.
- G. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- H. Connections: Fabricate railings with welded connections unless otherwise indicated.
- I. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove flux immediately.
  4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds; no evidence of a welded joint.
- J. Mechanical Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
- K. Form changes in direction as follows:
  1. As detailed.
- L. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- M. Close exposed ends of hollow railing members with prefabricated end fittings.
- N. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.
- O. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
  1. At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and to prevent bracket or fitting rotation and crushing of substrate.
- P. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- Q. For railing posts set in concrete, provide stainless-steel sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with metal plate forming bottom closure.

## 2.9 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipment.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. 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.
- D. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.

## 2.10 STAINLESS STEEL FINISHES

- A. Remove tool and die marks and stretch lines, or blend into finish.
- B. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.
- C. Directional Satin Finish: No. 4.
- D. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

## 2.11 STEEL AND IRON FINISHES

- A. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves.
- B. Preparing Nongalvanized Items for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below:
- C. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
  - 1. Shop prime uncoated railings with primers specified in Section 099123 "Interior Painting" unless indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. 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, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
  - 1. Do not weld, cut, or abrade surfaces of 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.

## DECORATIVE METAL RAILINGS

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2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
  3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

### 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 railings.
- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- 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 (50 mm) beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches (150 mm) of post.

### 3.4 ANCHORING POSTS

- A. 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 nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Form or core-drill holes not less than 5 inches (125 mm) deep and 3/4 inch (20 mm) larger than OD 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.
- C. Cover anchorage joint with flange of same metal as post, attached to post with set screws.
- D. Leave anchorage joint exposed with anchoring material flush with adjacent surface.



- E. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:

- 1. For steel railings, weld flanges to posts and bolt to metal-supporting surfaces.

### 3.5 ATTACHING RAILINGS

- A. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends or connected to railing ends using nonwelded connections.
- B. Attach handrails to walls with wall brackets except where end flanges are used. Provide brackets with 1-1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
  - 1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Secure wall brackets and railing end flanges to building construction as follows:
  - 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
  - 2. For hollow masonry anchorage, use toggle bolts.
  - 3. For steel-framed partitions, use hanger or lag bolts set into fire-retardant-treated wood backing between studs. Coordinate with stud installation to locate backing members.
  - 4. For steel-framed partitions, fasten brackets directly to steel framing or concealed steel reinforcements using self-tapping screws of size and type required to support structural loads.
  - 5. For steel-framed partitions, fasten brackets with toggle bolts installed through flanges of steel framing or through concealed steel reinforcements.

### 3.6 CLEANING

- A. Clean stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.
- B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - 1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

3.7 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of 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 057300

## SECTION 061000 - ROUGH CARPENTRY

### 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. This Section includes the following:
  - 1. Framing with dimension lumber.
  - 2. Wood blocking, cants, and nailers.
  - 3. Engineered wood products.
  - 4. Plywood backing panels.
- B. Related Sections include the following:
  - 1. Section 061600 "Sheathing."

#### 1.3 DEFINITIONS

- A. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
  - 1. NLGA: National Lumber Grades Authority.
  - 2. WCLIB: West Coast Lumber Inspection Bureau.
  - 3. WWPA: Western Wood Products Association.

#### 1.4 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 materials comply 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.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Engineered wood products.
4. Power-driven fasteners.
5. Post-installed anchors.
6. Metal framing anchors.

1.5 QUALITY ASSURANCE

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber 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 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.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWP C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWP C31 with inorganic boron (SBX).
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or 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 items indicated on Drawings, and the following:
  - 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 floor plates that are installed over concrete slabs-on-grade.
  - 4. Wood framing in Dugout Buildings.

## 2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply 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 E84, 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. Treatment shall 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 D2898. 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 D3201 at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Kiln-dry lumber after treatment to 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. Application: Treat items indicated on Drawings, and the following:

1. Concealed blocking.
2. Plywood backing panels.

## 2.4 DIMENSION LUMBER FRAMING

### A. Joists, Rafters, and Other Framing Not Listed Above: Construction or No. 2 grade.

1. Species:
  - a. Hem-fir (north); NLGA.
  - b. Southern pine; SPIB.
  - c. Douglas fir-larch; WCLIB or WWPA.
  - d. Southern pine or mixed southern pine; SPIB.

## 2.5 ENGINEERED WOOD LUMBER

### A. Laminated-Veneer Lumber: LVL: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D5456 and manufactured with an exterior-type adhesive complying with ASTM D2559.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - a. Louisiana-Pacific Company.
  - b. Weyerhaeuser.
2. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20.0 MPa) for 12-inch nominal- (286-mm actual-) depth members.
3. Modulus of Elasticity, Edgewise: 2,000,000 psi (13 700 MPa).
4. Size: As indicated on Drawings.
5. Preservative-treated.

## 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 items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content and any of the following species:

1. Hem-fir (north); NLGA.
2. Hem-fir; WCLIB, or WWPA.

- C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
  - 1. Hem-fir or hem-fir (north), Construction or 2 Common grade; NLGA, WCLIB, or WWP.
- D. 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.
- E. 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 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant-treated, in thickness indicated or, if not indicated, not less than 3/4-inch (19-mm) nominal thickness.

## 2.8 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/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. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- G. Masonry/Concrete Fasteners: shall be corrosion resistant, threaded fastener with low profile head. Fasteners to be Factory Mutual approved.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Construction Fasteners, Inc.; Confas.
    - b. ITW Buildex; Tapcon Flat-Head Phillips.

- H. Steel/ Wood Fasteners: shall be corrosion resistant, self-tapping, self-drilling screw with low profile head. Fasteners to be Factory Mutual approved.
1. Products: Subject to compliance with requirements, provide one of the following:
- a. Construction Fasteners, Inc.; Dekfast with Sentri Coating.
  - b. ITW Buildex; Roof Grip with Climaseal Coating.
  - c. Olympic Manufacturing Group, Inc.; Standard Roofing Fastener with CR-10 Coating.
- I. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies 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 and inspecting agency.
1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
- J. All fasteners must be carbon steel with corrosion resistant coating. Fasteners shall meet FM 4770.

## 2.9 METAL FRAMING ANCHORS

- A. Allowable design loads, as published by manufacturer, shall meet or exceed those of products of manufacturers listed. 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. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- B. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; 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.
- C. Rafter Tie-Downs: Bent strap tie for fastening rafters or roof trusses to wall studs below, 1-1/2 inches (38 mm) wide by 0.050 inch (1.3 mm) thick.

## 2.10 MISCELLANEOUS MATERIALS

- A. 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.



## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Do not splice structural members between supports, unless otherwise indicated.
- D. 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.
- E. 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.
- F. Comply with AWP A 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.
- G. 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.
- H. 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 between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.
- I. Plywood joints must be true and well fitting, allowing for expansion and contraction. Allow 1/8 inch at end and edge joints.
- J. Plywood fasteners are to be a maximum grid pattern of 24 inches o.c.

### 3.2 WOOD BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.
- C. Nailers shall be fastened according to Factory Mutual Data Sheet 1-49.
- D. Nailers shall be anchored to resist a pull of 175 lbs./ foot in any direction.

### 3.3 INSTALLATION OF CEILING JOIST AND RAFTER FRAMING

- A. Ceiling Joists: Install with crown edge up and complying with requirements specified above for floor joists. Face nail to ends of parallel rafters.
  - 1. Where ceiling joists are at right angles to rafters, provide additional short joists parallel to rafters from wall plate to first joist; nail to ends of rafters and to top plate, and nail to first joist or anchor with framing anchors or metal straps. Provide 1-by-8-inch nominal- (19-by-184-mm actual-) size or 2-by-4-inch nominal- (38-by-89-mm actual-) size stringers spaced 48 inches (1200 mm) o.c. crosswise over main ceiling joists.
- B. Rafters: Notch to fit exterior wall plates and use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.
- C. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

### 3.4 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 061000



## 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 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:

- 1. Wall and roof sheathing.

- B. Related Requirements:

- 1. Section 061000 "Rough Carpentry" for plywood backing panels.
  - 2. Section 072720 "Fluid-Applied Membrane Air Barriers" for air barriers applied over wall sheathing.

#### 1.3 ACTION 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. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
  - 3. For fire-retardant treatments, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5516.
  - 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
  - 5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For following products, from ICC-ES:

1. Preservative-treated plywood.
2. Fire-retardant-treated plywood.
3. Foam-plastic sheathing.

## 1.5 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.

## 1.6 DELIVERY, STORAGE, AND HANDLING

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

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- 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."

### 2.2 WOOD PANEL PRODUCTS

- A. Emissions: Products shall meet the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.
- 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.

## 2.3 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWPAC 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.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

## 2.4 WALL SHEATHING

- A. Plywood Wall and Roof Sheathing: APA rated Exterior, Structural 1, with waterproof glue.
  - 1. Span Rating: Not less than 16/0.
  - 2. Nominal Thickness: Not less than 3/4 inch, unless otherwise indicated.
- B. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. CertainTeed Corporation; GlasRoc.
    - b. G-P Gypsum Corporation; Dens-Glass Gold.
    - c. National Gypsum Company; Gold Bond e(2)XP.
    - d. Temple Inland, Inc.; Green Glass.
    - e. United States Gypsum Co.; Securock.
  - 2. Type and Thickness: Regular, 1/2 inch (13 mm) thick.
  - 3. Size: 48 by 120 inches (1219 by 3048 mm) for vertical installation.

## 2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
- 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 Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
  - 1. For steel framing less than 0.0329 inch (0.835 mm) thick, use screws that comply with ASTM C 1002.
  - 2. For steel framing from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick, use screws that comply with ASTM C 954.

### 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. Arrange joints so that pieces do not span between fewer than three support members.
- 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."
- 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 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. E30, "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. Screw to cold-formed metal framing.
  - b. Nail to wood framing.
  - c. Space panels 1/8 inch (3 mm) apart at edges and ends.

3.3 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.

1. Fasten gypsum sheathing to cold-formed metal framing with screws.
2. Install boards with a 3/8-inch (9.5-mm) gap where non-load-bearing construction abuts structural elements.
3. Install boards with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing, but do not cut into facing.

C. Horizontal Installation: Install sheathing with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent boards without forcing. Abut ends of boards over centers of studs, and stagger end joints of adjacent boards not less than one stud spacing. Attach boards at perimeter and within field of board to each steel stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.
2. For sheathing under stucco cladding, boards may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

D. Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.

1. Space fasteners approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9.5 mm) from edges and ends of boards.

END OF SECTION 061600



## SECTION 061800 - GLUED-LAMINATED CONSTRUCTION

### 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 framing using structural glued-laminated timber.
- B. Related Sections:
  - 1. Section 061000 "Rough Carpentry" for dimension lumber items associated with structural glued-laminated timber.

#### 1.3 DEFINITIONS

- A. Structural Glued-Laminated (Glulam) Timber: An engineered, stress-rated timber product assembled from selected and prepared wood laminations bonded together with adhesives and with the grain of the laminations approximately parallel longitudinally.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Structural glued-laminated timber and connectors shall withstand the effects of structural loads shown on Drawings without exceeding allowable design working stresses listed in AITC 117 or determined according to ASTM D 3737 and acceptable to authorities having jurisdiction.

#### 1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
  - 1. Include data on lumber, adhesives, fabrication, and protection.
  - 2. For preservative-treated wood products, include chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
  - 3. For connectors, include installation instructions.
- B. Shop Drawings:
  - 1. Show layout of structural glued-laminated timber system and full dimensions of each member.

2. Indicate species and laminating combination, adhesive type, and other variables in required work.
  3. Include large-scale details of connections.
- C. Certificates of Conformance: Issued by a qualified testing and inspecting agency indicating that structural glued-laminated timber complies with requirements in AITC A190.1.
- D. Material Certificates: For preservative-treated wood products, from manufacturer. Indicate type of preservative used and net amount of preservative retained.
- E. Research/Evaluation Reports: For structural glued-laminated timber and timber connectors.

## 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide factory-glued structural units produced by an AITC- or APA-licensed firm.
1. Factory mark each piece of structural glued-laminated timber with AITC Quality Mark or APA-EWS trademark. Place mark on surfaces that will not be exposed in the completed Work.
- B. Quality Standard: Comply with AITC A190.1, "Structural Glued Laminated Timber."

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. General: Comply with provisions in AITC 111.
- B. Individually wrap members using plastic-coated paper covering with water-resistant seams.

## PART 2 - PRODUCTS

### 2.1 STRUCTURAL GLUED-LAMINATED TIMBER

- A. General: Provide structural glued-laminated timber that complies with AITC A190.1 and AITC 117 or research/evaluation reports acceptable to authorities having jurisdiction.
1. Provide structural glued-laminated timber made from single species.
  2. Provide structural glued-laminated timber made from solid lumber laminations; do not use laminated veneer lumber.
  3. Provide structural glued-laminated timber made with wet-use adhesive complying with AITC A190.1.
    - a. Use adhesive that contains no urea-formaldehyde resins.
- B. Species and Grades for Structural Glued-Laminated Timber: Yellow cedar that complies with structural properties indicated.

C. Species and Grades for Beams:

1. Species and Beam Stress Classification: Yellow cedar, 24F-1.8E.
2. Lay-up: Balanced.
3. Species and Combination Symbol: Yellow cedar, 24F-E4

D. Appearance Grade: Architectural appearance grade, complying with AITC 110.

1. For Architectural appearance grades, fill voids as required by AITC 110.

E. Preservative Treatment: All structural glued-laminated timber shall be preservative-treated, comply with AWP A U1, Use Category 3B.

1. Use preservative solution without water repellents or substances that might interfere with application of indicated finishes.
2. Do not incise structural glued-laminated timber or wood used to produce structural glued-laminated timber.

F. Preservative: One of the following:

1. Oxine copper (copper-8-quinolinolate) in a light petroleum solvent.
2. Pentachlorophenol in light petroleum solvent.
3. Copper naphthenate in a light petroleum solvent.
4. Ammoniacal zinc copper arsenate (ACZA) in a water solution.
5. Chromated copper arsenate (CCA) in a water solution.
6. Ammoniacal copper quat Type A (ACQ-C) in a water solution.
7. Propiconazole tebuconazole imidacloprid (PTI) in a water emulsion.

G. After dressing members, apply a copper naphthenate field-treatment preservative to comply with AWP A M4 to surfaces cut to a depth of more than 1/16 inch (1.5 mm).

H. End Sealer: Manufacturer's standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.

I. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.

J. Finish: shop sealed, stained and finished.

## 2.2 TIMBER CONNECTORS

A. General: Unless otherwise indicated, fabricate from the following materials:

1. Structural-steel shapes, plates, and flat bars complying with ASTM A 36/A 36M.
2. Round steel bars complying with ASTM A 575, Grade M 1020.
3. Hot-rolled steel sheet complying with ASTM A 1011/A 1011M, Structural Steel, Type SS, Grade 33.

- B. Fabricate beam seats from steel with bearing plates per drawings.
- C. Fabricate tie rods from round steel bars with upset threads connected with forged-steel turnbuckles complying with ASTM A 668/A 668M.
- D. Provide bolts, 3/4 inch (19 mm) unless otherwise indicated, complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); nuts complying with ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.
- E. Finish steel assemblies and fasteners with rust-inhibitive primer, 2-mil (0.05-mm) dry film thickness.
- F. Hot-dip galvanize steel assemblies and fasteners after fabrication to comply with ASTM A 123/A 123M or ASTM A 153/A 153M.

## 2.3 FABRICATION

- A. Shop fabricate for connections to greatest extent possible, including cutting to length and drilling bolt holes.
  - 1. Dress exposed surfaces as needed to remove planing and surfacing marks.
- B. Camber: Fabricate horizontal and inclined members of less than 1:1 slope with either circular or parabolic camber equal to 1/500 of span.
- C. Where preservative-treated members are indicated, fabricate (cut, drill, surface, and sand) before treatment to greatest extent possible. Where fabrication must be done after treatment, apply a field-treatment preservative to comply with AWP A M4.
  - 1. Use inorganic boron (SBX) treatment for members not in contact with the ground and continuously protected from liquid water.
  - 2. Use copper naphthenate treatment for members in contact with the ground or not continuously protected from liquid water.
- D. End-Cut Sealing: Immediately after end cutting each member to final length and after preservative treatment, apply a saturation coat of end sealer to ends and other cross-cut surfaces, keeping surfaces flood coated for not less than 10 minutes.
- E. Seal Coat: After fabricating, sanding, and end-coat sealing, apply a heavy saturation coat of penetrating sealer on surfaces of each unit except for preservative-treated wood where treatment included a water repellent.

## 2.4 FACTORY FINISHING

- A. Clear Finish: Manufacturer's standard, two-coat, penetrating oil finish; resistant to mildew and fungus.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates in areas to receive structural glued-laminated timber, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of structural glued-laminated timber.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Erect structural glued-laminated timber true and plumb, and with uniform, close-fitting joints. Provide temporary bracing to maintain lines and levels until permanent supporting members are in place.
  - 1. Lift with padded slings and protect corners with wood blocking.
  - 2. Install structural glued-laminated timber to comply with Shop Drawings.
  - 3. Install timber connectors as indicated.
- B. Fit structural glued-laminated timber by cutting and restoring exposed surfaces to match specified surfacing and finishing.
  - 1. Predrill for fasteners using timber connectors as templates.
  - 2. Dress exposed surfaces as needed to remove planing and surfacing marks.
  - 3. Coat cross cuts with end sealer.
  - 4. Where preservative-treated members must be cut during erection, apply a field-treatment preservative to comply with AWP A M4.
    - a. Use inorganic boron (SBX) treatment for members not in contact with the ground and continuously protected from liquid water.
    - b. Use copper naphthenate treatment for members in contact with the ground or not continuously protected from liquid water.
- C. Cutting: Avoid cutting after fabrication. Where field fitting is unavoidable, comply with requirements for shop fabrication.
  - 1. Where preservative-treated members must be cut during erection, apply a field-treatment preservative to comply with AWP A M4.
    - a. Use inorganic boron (SBX) treatment for members not in contact with the ground and continuously protected from liquid water.
    - b. Use copper naphthenate treatment for members in contact with the ground or not continuously protected from liquid water.

3.3 ADJUSTING

- A. Repair damaged surfaces and finishes after completing erection. Replace damaged structural glued-laminated timber if repairs are not approved by Architect.

3.4 PROTECTION

- A. Do not remove wrappings on individually wrapped members until they no longer serve a useful purpose including protection from weather, sunlight, soiling, and damage from work of other trades.
  - 1. Coordinate wrapping removal with finishing work specified in Division 09. Retain wrapping where it can serve as a painting shield.
  - 2. Slit underside of wrapping to prevent accumulation of moisture inside the wrapping.

END OF SECTION 061800

## SECTION 064023 - INTERIOR ARCHITECTURAL WOODWORK

### 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. This Section includes the following:
  - 1. Interior standing and running trim.
  - 2. Wood acoustical Control Booth window frame.
  - 3. Display cases and benches.
  - 4. Hardware incorporated with finish carpentry work.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Section 061053 "Miscellaneous Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.
  - 2. Section 099300 "Staining and Transparent Finishing" for field finishing of installed interior architectural woodwork.
  - 3. Section 123661.16 "Solid Surfacing Countertops and Window Sills".
  - 4. Section 123200 "Manufactured Wood Casework" for modular casework units for classrooms.
  - 5. Section 265100 "Interior Lighting" for light fixtures in display case.

#### 1.3 DEFINITIONS

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.
- B. Transparent Finish: Clear or stained finish allowing the configuration of the grain of wood to be visible through the finish.
- C. Opaque or Paint Finish: A pigmented finish that completely conceals the configuration of the grain of the wood.

#### 1.4 SUBMITTALS

- A. Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each type of product and process specified and incorporated into items of architectural woodwork during fabrication, finishing, and installation.
- C. Shop drawings showing location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
  - 1. Show details at drawing scale of 1-1/2" = 1'-0".
  - 2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcing specified in other Sections.
  - 3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, and other items installed in architectural woodwork.
- D. Samples for verification of the following:
  - 1. Lumber with or for transparent finish, 50 sq. in. (300 sq. cm), for each species and cut, finished on one side and one edge.
  - 2. Exposed display case hardware, one unit for each type and finish.
  - 3. Veneer-faced panel products with or for transparent finish, 8 by 10 inches (200 by 250 mm), for each species and cut. Include at least one face-veneer seam and finish as specified.
  - 4. Panel products with shop-applied opaque finish, 8 by 10 inches (200 by 250 mm) for panels, for each finish system and color, with panel exposed surface finished on one side only.
- E. Product certificates signed by woodwork fabricator certifying that products comply with specified requirements.
- F. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

#### 1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm experienced in producing architectural woodwork similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units without delaying the Work.
- B. Installer Qualifications: Arrange for interior architectural woodwork installation by a firm that can demonstrate successful experience in installing architectural woodwork items similar in type and quality to those required for this Project.



- C. Single-Source Responsibility for Fabrication and Installation: Engage a qualified woodworking firm to assume undivided responsibility for fabricating, finishing, and installing woodwork specified in this Section.
- D. Quality Standard: Except as otherwise indicated, comply with the following standard:
  - 1. AWI Quality Standard: "Architectural Woodwork Quality Standards" of the Architectural Woodwork Institute for grades of interior architectural woodwork, construction, finishes, and other requirements.
    - a. Provide AWI Certification Labels or Certificates of Compliance indicating that woodwork meets requirements of grades specified.
  - 2. The Contract Documents contain selections chosen from options in the Quality Standard as well as additional requirements beyond those of the Quality Standard. Comply with such selections and requirements in addition to the Quality Standard.

#### 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver woodwork until painting and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

#### 1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Obtain and comply with woodwork fabricator's and Installer's coordinated advice for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized so that woodwork will be within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.
- B. Field Measurements: Where woodwork is indicated to be fitted to other construction, check actual dimensions of other construction by accurate field measurements before fabrication, and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
  - 1. Verify locations of concealed framing, blocking, reinforcements, and furring that support woodwork by accurate field measurements before being enclosed. Record measurements on final shop drawings.
  - 2. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site and coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

## 1.8 COORDINATION

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

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade indicated and, where the following products are part of interior woodwork, with requirements of the referenced product standards that apply to product characteristics indicated:
  - 1. Hardboard: AHA A135.4.
  - 2. Medium-Density Fiberboard: ANSI A208.2.
  - 3. Particleboard: ANSI A208.1, Grade M-2, medium density.
  - 4. Softwood Plywood: PS 1.
  - 5. Hardwood Plywood and Face Veneers: HPVA HP-1.
- B. Formaldehyde Emission Level for Medium-Density Fiberboard: Comply with requirements of NPA 9.
- C. Fiberboard: Medium-density fiberboard and complying with ANSI A208.2.
  - 1. Product: Subject to compliance with requirements, provide the following:
    - a. Medite Corporation; Medite II.
- D. Clear, Tempered Float Glass for Display Cases: ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality q3; manufactured by horizontal (roller hearth) process, with exposed edges seamed before tempering, 6 mm thick, unless otherwise indicated.

### 2.2 INSTALLATION MATERIALS

- A. Screws: Select material, type, size, and finish required for each use. Comply with ASME B18.6.1 for applicable requirements.
  - 1. For metal framing supports, provide screws as recommended by metal-framing manufacturer.
- B. Nails: Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.

- C. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors.

## 2.3 FABRICATION, GENERAL

- A. Interior Woodwork Grade: Provide interior woodwork complying with the referenced quality standard and of the following grade:
  - 1. Grade: Custom.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to relative humidity conditions existing during time of fabrication and in installation areas.
- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
  - 1. Corners of cabinets and edges of solid-wood (lumber) members 3/4 inch (19 mm) thick or less: 1/16 inch (1.5 mm).
  - 2. Edges of rails and similar members more than 3/4 inch (19 mm) thick: 1/8 inch (3 mm).
- D. Complete fabrication, including assembly, finishing, and hardware application, before shipment to Project site to maximum extent possible. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
  - 1. Trial fit assemblies at the fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on approved shop drawings before disassembling for shipment.
- E. Shop-cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Smooth edges of cutouts and, where located in countertops and similar exposures, seal edges with a water-resistant coating.
- F. Install glass to comply with applicable requirements of Section 088000 "Glazing" and of FGMA "Glazing Manual." For glass in wood frames, secure glass with removable stops.

## 2.4 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH

- A. Quality Standard: Comply with AWI Section 300.

- B. It is the intent that the variations in grain characteristics and color at the jointing of continuous wood sections shall be minimal and not detectible at a distance of 10 feet. The joints in any rail or trim members shall be kept to a minimum by providing the maximum lengths of wood for railing or trim. Samples must be submitted for approval prior to manufacturing of the final rail or trim members and the approved samples will be the standard for allowable variations at the project site.
- C. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
- D. Assemble casings in plant except where limitations of access to place of installation require field assembly.
- E. Assemble moldings in plant to maximum extent possible. Miter corners in plant and prepare for field assembly with bolted fittings designed to pull connections together.
- F. Wood Species: Match species and cut indicated for other types of transparent-finished architectural woodwork located in same area of building, unless otherwise indicated.
  - 1. Provide split species on trim that face areas with different wood species, matching each face of woodwork to species and cut of finish wood surfaces in areas finished.
  - 2. Solid Wood Trim with Transparent Finish: White Maple, plain sawn, stained to match wood doors.

## 2.5 HARDWOOD SHEET MATERIALS

- A. Composite Wood: Provide materials that comply with requirements of the Architectural Woodwork Standards for each type of interior architectural woodwork and quality grade specified unless otherwise indicated.
  - 1. Medium-Density Fiberboard (MDF): ANSI A208.2 Grade 130.
  - 2. Particleboard: ANSI A208.1 Grade M-2.
  - 3. Softwood Plywood: DOC PS 1, medium-density overlay.
  - 4. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.
  - 5. Veneer Species: Select White Maple, plain sliced.

## 2.6 WOOD ACOUSTICAL CONTROL BOOTH WINDOW FRAME

- A. Comply with Article 2.4, Interior Standing and Running Trim for Transparent Finish” and installation requirements for trim in this Section.
- B. Location Frame Elevation “25” between Control Booth and Visual/Audio Studio.
- C. Wood Species and Cut: As indicated on window details.

## 2.7 DISPLAY CASE

- A. AWI Quality Grade: Custom.
- B. Glass: Clear tempered glass door and shelves as specified in this Section.
- C. Tackable Panels:
  - 1. Backing: 1/2-inch fire-rated structural building board.
    - a. Product: Subject to compliance with requirements, provide the following, or approved equal:
      - 1) Micore; Micore 300.
  - 2. Fabric Surfacing:
    - a. Product: Subject to compliance with requirements, as specified in Section 097723 "Fabric-Wrapped Panels."
- D. Shelving Supports: Refer to Display Case Hardware Article in this Section.

## 2.8 DISPLAY CASE HARDWARE

- A. Shelf Standards, Brackets, and Accessories for Display Cases:
  - 1. Rear Supported Shelves:
    - a. Product: Subject to compliance with requirements, provide Knappe and Vogt Manufacturing Co.; 82/182 Decorative Heavy-Duty Shelving System including all standards, brackets, accessories, and fasteners for complete installation to suit project conditions and shelf types.
      - 1) Standards shall be in continuous lengths to suit heights shown.
        - a) Color: White.
      - 2) Brackets: U-shaped, twin slotted lock-in design for shelves. Reference drawings for shelf depths.
        - a) Color: White.
      - 3) Accessories shall include manufacturer's standard fasteners and cushion supports for glass shelves.
- B. Shelf Pilasters and Supports:
  - 1. Product: Subject to compliance with requirements, provide K&V; 255 Steel and 256R, zinc finish.

- C. Pivot Hinge:
  - 1. Product: Subject to compliance with requirements, provide CR Laurence CO, Inc. PPH301SC.
- D. Locks:
  - 1. Product: Subject to compliance with requirements, provide cylindrical cam lock that works with glass thickness indicated.
- E. Pulls:
  - 1. Product: Subject to compliance with requirements, provide KV836 door pulls (anachrome).
- F. Bumpers:
  - 1. Product: Subject to compliance with requirements, provide KV1087 rub door bumper.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Condition woodwork to average prevailing humidity conditions in installation areas before installing.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

#### 3.2 INSTALLATION

- A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.
- B. Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm) for plumb and level (including tops).
- C. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.

- E. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Do not use pieces less than 36 inches (900 mm) long, except where necessary. Stagger joints 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.
  - 1. Install standing and running trim with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) variation from a straight line.
- F. Tops: Anchor securely to base units and other support systems as indicated. Calk space between backsplash and wall with specified sealant.
  - 1. Install countertops with no more than 1/8 inch in 96-inch (3 mm in 2400-mm) sag, bow, or other variation from a straight line.

### 3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork where possible to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

### 3.4 PROTECTION

- A. Provide final protection and maintain conditions in a manner acceptable to fabricator and Installer that ensures that woodwork is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 064023





## SECTION 066400 - PLASTIC PANELING – FRP

### 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. Plastic sheet paneling.

#### 1.3 ACTION SUBMITTALS

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

#### 1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install plastic paneling until spaces are enclosed and weathertight and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain plastic paneling and trim accessories from single manufacturer.

#### 2.2 PLASTIC SHEET PANELING

- A. Glass-Fiber-Reinforced Plastic Paneling: Gelcoat-finished, glass-fiber-reinforced plastic panels complying with ASTM D 5319. Panels shall be USDA accepted for incidental food contact.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Crane Composites, Inc.; Varietex Sandstone Texture or a comparable product by one of the following:

- a. Glasteel.
  - b. Marlite.
  - c. Newcourt, Inc.
  - d. Nudo Products, Inc.
  - e. Parkland Plastics, Inc.
2. Color: Selected by the Architect from manufacturer's full range of colors.
3. Surface-Burning Characteristics: As follows when tested by a qualified testing agency according to ASTM E 84. Identify products with appropriate markings of applicable testing agency.
  - a. Flame-Spread Index: 200 or less.
  - b. Smoke-Developed Index: 450 or less.
4. Nominal Thickness: Not less than 0.09 inch (2.3 mm).
5. Surface Finish: Sandstone Textured

## 2.3 ACCESSORIES

- A. Trim Accessories: Manufacturer's standard one-piece vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.
  1. Color: Match panels.
- B. Exposed Fasteners: Nylon drive rivets recommended by panel manufacturer.
- C. Concealed Mounting Splines: Continuous, H-shaped aluminum extrusions designed to fit into grooves routed in edges of factory-laminated panels and to be fastened to substrate.
- D. Sealant: Mildew-resistant, single-component, neutral-curing or acid-curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Section 079200 "Joint Sealants."

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of substances that could impair adhesive bond, including oil, grease, dirt, and dust.
- B. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.
- C. Lay out paneling before installing. Locate panel joints so that trimmed panels at corners are not less than 12 inches (300 mm) wide.
  - 1. Mark plumb lines on substrate at panel joint locations for accurate installation.
  - 2. Locate panel joints to allow clearance at panel edges according to manufacturer's written instructions.

### 3.3 INSTALLATION

- A. Install plastic paneling according to manufacturer's written instructions.
- B. Install panels with fasteners. Layout fastener locations and mark on face of panels so that fasteners are accurately aligned.
  - 1. Drill oversized fastener holes in panels and center fasteners in holes.
  - 2. Apply sealant to fastener holes before installing fasteners.
- C. Install trim accessories with adhesive.
- D. Fill grooves in trim accessories with sealant before installing panels, and bed inside corner trim in a bead of sealant.
- E. Maintain uniform space between panels and wall fixtures. Fill space with sealant.
- F. Maintain uniform space between adjacent panels and between panels and floors, ceilings, and fixtures. Fill space with sealant.
- G. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION 066400



## SECTION 071326 - SELF-ADHERING SHEET WATERPROOFING

### 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. Modified bituminous sheet waterproofing.

#### 1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
  - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.
- B. Shop Drawings: Show locations and extent of waterproofing and details of substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.

- C. Sample Warranties: For special warranties.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver liquid materials to Project site in original packages with seals unbroken, 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 packages in a clean, dry, protected location and within temperature range required by waterproofing manufacturer.
- C. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- D. Store rolls according to manufacturer's written instructions.
- E. Protect stored materials from direct sunlight.

## 1.8 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
  - 1. Do not apply waterproofing in snow, rain, fog, or mist.
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

## 1.9 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard materials-only warranty in which manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.
  - 1. Warranty Period: Three years from date of Substantial Completion.
- B. Installer's Special Warranty: Specified form, on warranty form at end of this Section, signed by Installer, covering Work of this Section, for warranty period of two years.
  - 1. Warranty includes removing and reinstalling protection board, drainage panels and insulation.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

- A. Source Limitations for Waterproofing System: Obtain waterproofing materials from single source from single manufacturer.

### 2.2 MODIFIED BITUMINOUS SHEET WATERPROOFING

- A. Modified Bituminous Sheet: Minimum 60-mil (1.5-mm) nominal thickness, self-adhering sheet consisting of 56 mils (1.4 mm) of rubberized asphalt laminated on one side to a 4-mil- (0.10-mm-) thick, polyethylene-film reinforcement, and with release liner on adhesive side.
1. Products: Subject to compliance with requirements, provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. American Hydrotech, Inc; VM75.
    - b. Carlisle Coatings & Waterproofing Inc; CCW MiraDRI 860/861.
    - c. CETCO Building Materials Group, a subsidiary of AMCOL International Corp; Envirosheet.
    - d. Grace Construction Products; W.R. Grace & Co. -- Conn; Bituthene 3000/Low Temperature or Bituthene 4000.
    - e. Henry Company; Blueskin WP 100/200.
    - f. Meadows, W.R.,Inc; SealTight Mel-Rol.
    - g. Nervastral, Inc; BITU-MEM.
    - h. Polyguard Products, Inc; Polyguard 650.
    - i. Protecto Wrap Company; PW 100/60.
    - j. Tamko Building Products, Inc; TW-60.
    - k. York Manufacturing, Inc; HydroGard.
  2. Physical Properties:
    - a. Tensile Strength, Membrane: 250 psi (1.7 MPa) minimum; ASTM D 412, Die C, modified.
    - b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
    - c. Low-Temperature Flexibility: Pass at minus 20 deg F (minus 29 deg C); ASTM D 1970.
    - d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch (3-mm) movement; ASTM C 836.
    - e. Puncture Resistance: 40 lbf (180 N) minimum; ASTM E 154.
    - f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F (21 deg C); ASTM D 570.
    - g. Water Vapor Permeance: 0.05 perms (2.9 ng/Pa x s x sq.m) maximum; ASTM E 96/E 96M, Water Method.
    - h. Hydrostatic-Head Resistance: 200 feet (60 m) minimum; ASTM D 5385.

3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

## 2.3 AUXILIARY MATERIALS

- A. General: Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
  1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid waterborne primer recommended for substrate by sheet-waterproofing material manufacturer.
- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.
- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
- E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.
- F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick, predrilled at 9-inch (229-mm) centers.
- G. Protection Course: ASTM D 6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
  1. Thickness: Nominal 1/8 inch (3 mm).
  2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the waterproofing.
  1. Verify that concrete has cured and aged for minimum time period recommended in writing by waterproofing manufacturer.
  2. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
  3. Verify that compacted subgrade is dry, smooth, sound, and ready to receive waterproofing sheet.



- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids.
- E. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
1. Install sheet strips of width according to manufacturer's written instructions and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch (1.6 mm) or 1/8 inch (3 mm) for modified bituminous deck-paving waterproofing.
- F. Bridge and cover isolation joints expansion joints and discontinuous deck-to-wall and deck-to-deck joints with overlapping sheet strips of widths according to manufacturer's written instructions.
1. Invert and loosely lay first sheet strip over center of joint. Firmly adhere second sheet strip to first and overlap to substrate.
- G. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.
1. Install membrane strips centered over vertical inside corners. Install 3/4-inch (19-mm) fillets of liquid membrane on horizontal inside corners and as follows:
- a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
- H. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D 6135.

### 3.3 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and recommendations in ASTM D 6135.

- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 2-1/2-inch- (64-mm-) minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure watertight installation.
  - 1. When ambient and substrate temperatures range between 25 and 40 deg F (minus 4 and plus 5 deg C), install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F (16 deg C).
- D. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- E. Seal edges of sheet-waterproofing terminations with mastic.
- F. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.
- G. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.
- H. Immediately install protection course with butted joints over waterproofing membrane.

### 3.4 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect waterproofing from damage and wear during remainder of construction period.
- C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071326

## SECTION 072100 - THERMAL INSULATION

### 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. This Section includes the following:
  - 1. Foam-plastic board insulation.
  - 2. Mineral wool board insulation.
  - 3. Glass-fiber blanket insulation
  - 4. Cladding attachment system.
  - 5. Spray polyurethane foam insulation.
  - 6. Pressure injected foam insulation at Locker Room/Concessions Building.

#### 1.3 DEFINITIONS

- A. Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in boards and blanket with latter formed into batts (flat-cut lengths) or rolls.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. Plenum Rating: Provide glass-fiber insulation where indicated in ceiling plenums whose test performance is rated as follows for use in plenums as determined by testing identical products per "Erosion Test" and "Mold Growth and Humidity Test" described in UL 181, or on comparable tests from another standard acceptable to authorities having jurisdiction.
  - 1. Erosion Test Results: Insulation shows no visible evidence of cracking, flaking, peeling, or delamination of interior surface of duct assembly, after testing for 4 hours at 2500-fpm (13-m/s) air velocity.
  - 2. Mold Growth and Humidity Test Results: Insulation shows no evidence of mold growth, delamination, or other deterioration due to the effects of high humidity, after inoculation with Chaetomium globosum on all surfaces and storing for 60 days at 100 percent relative humidity in the dark.

#### 1.5 SUBMITTALS

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

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## 1.6 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect plastic insulation as follows:
  - 1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
  - 2. Protect 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.

## PART 2 - PRODUCTS

### 2.1 FOAM-PLASTIC BOARD INSULATION

- A. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. DiversiFoam Products.
    - b. Dow Chemical Company.
    - c. Owens Corning.
    - d. Pactiv Building Products Division.
  - 2. Type IV, 25 psi (173 kPa).
  - 3. Cavity wall insulation at sheathing substrates behind brick veneer: 2-inch thickness.

### 2.2 MINERAL-WOOL BOARD INSULATION

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Rockwool; Cavityrock with black mat facer for open-joint rainscreen systems, or comparable product by one of the following:

1. Isolatek International.
  2. Roxul Inc.
  3. Thermafiber, Inc.; an Owens Corning company.
- B. Faced, Mineral-Wool Board Insulation: ASTM C 612; with maximum flame-spread and smoke-developed indexes of 15 and zero, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
1. Nominal density of 6 lb/cu. ft. (96 kg/cu. m), Type II, thermal resistivity of 4.16 deg F x h x sq. ft./Btu x in. at 75 deg F (28.8 K x m/W at 24 deg C).
  2. Fiber Color: Natural.
  3. Facing: Black mineral fleece facing designed for open-joint cladding systems.
  4. Thickness: 4 inches, unless otherwise indicated.

## 2.3 GLASS-FIBER BLANKET INSULATION

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CertainTeed Corporation.
  2. Guardian Fiberglass, Inc.
  3. Johns Manville.
  4. Knauf Fiber Glass.
  5. Owens Corning.
- B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
- C. Where glass-fiber blanket insulation is indicated by the following thicknesses, provide blankets in batt or roll form with thermal resistances indicated:
1. 3-5/8 inches (92 mm) thick with a thermal resistance of 11 deg F x h x sq. ft./Btu at 75 deg F (1.9 K x sq. m/W at 24 deg C).
  2. 6-1/2 inches (165 mm) thick with a thermal resistance of 19 deg F x h x sq. ft./Btu at 75 deg F (3.3 K x sq. m/W at 24 deg C).
  3. 9-1/2 inches (241 mm) thick with a thermal resistance of 30 deg F x h x sq. ft./Btu at 75 deg F (5.2 K x sq. m/W at 24 deg C).

## 2.4 SPRAY POLYURETHANE FOAM INSULATION

- A. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. BASF Corporation.
  - b. BaySystems NorthAmerica, LLC.
  - c. Dow Chemical Company (The).
  - d. Gaco Western, Inc.
  - e. Henry Company.
  - f. NCFI; Division of Barnhardt Mfg. Co.
2. Minimum density of 1.5 lb/cu. ft. (24 kg/cu. m), thermal resistivity of 6.2 deg F x h x sq. ft./Btu x in. at 75 deg F (43 K x m/W at 24 deg C).
- B. Intumescent Paint: Subject to compliance with requirements and sprayed foam manufacturer's approval, provide the following or approved equal:
  1. International Fireproof Technology Inc.; DC-315.

## 2.5 CLADDING ATTACHMENT SYSTEM

- A. Polyester and vinyl ester bioresin matrix with recycled materials, fire retardant additives and integral continuous metal inserts the length of profile. Reinforce girts with glass strand rovings used internally for longitudinal strength and continuous strand glass mats or stitched reinforcements used internally for transverse strength.
  1. Products: Subject to compliance with requirements, provide the following:
    - a. Advanced Architectural Products (A2P); SMART ci 2-in-1 System.
  2. Girt Depth: To match insulation thickness.
  3. Spacing: 24 inches on center, applied horizontally and secured to each framing stud.
  4. Provide manufacturer's standard continuous 16-gauge galvanized steel continuous insert for engagement of fasteners into metal framing.
  5. Provide manufacturer's standard integral three-point compression seal to prevent insulation panels from dislodging.
  6. Provide manufacturer's standard integral anti-siphon grooves on exterior and interior flanges of girt members.
  7. Provide manufacturer's standard spline seals for adjacent insulation units into profile of girt members.
- B. Sub-framing and Thermal Spacer System at Contractor's Option: 100% pultruded glass fiber and thermoset polyester resin insulation clip.
  1. Products: Subject to compliance with requirements, provide the following:
    - a. Cascadia Windows, Inc.; Cascadia Clip.
  2. Thermal spacer Thickness for top, base, and web: 4.8 mm, nominal.
  3. Spacer Fasteners: High hex head washer head with sharp twin threaded design of heat-treated corrosion resistant coated steel, supplied by manufacturer for type of framing.
  4. Cladding support sub-framing:

- a. Minimum 18-gauge, 33 ksi factory-punched sheet steel with fastener holes to match fiberglass thermal spacers.
- b. Corrosion resistant coating on sub-framing: Galvalume AZM 150 (AZ 50).
- c. Sub-framing profiles: Z-profile for vertically oriented sub-framing, hat-profile for horizontally-oriented sub-framing, and additionally as required by cladding manufacturer or cladding structural engineer.

- 1) Typical Sub-framing Depth: 1 inch (25mm).

## 2.6 PRESSURE INJECTED FOAM INSULATION AT LOCKER ROOM/CONCESSIONS BUILDING

- A. Open-cell pressure-injected foam to fill vertical cavities of concrete masonry units.
- B. Product: Subject to compliance with requirements, provide the following:
  1. Tailored Foam; Core-Fill 500.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and for other conditions affecting performance.
  1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

### 3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

- D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
- E. For preformed insulating units, provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

### 3.4 INSTALLATION OF PERIMETER FOUNDATION INSULATION

- A. On vertical surfaces of excavated trenched footings, set insulation units against undisturbed side of trench and secure with metal or plastic spindles. Provide 2-inch thick extruded polystyrene board insulation, 24 inches deep, unless otherwise indicated.
  - 1. If not otherwise indicated, extend insulation a minimum of 24 inches (610 mm) below exterior grade line.

### 3.5 INSTALLATION OF FOAM PLASTIC INSULATION IN CAVITY WALLS

- A. As specified in Section 042000 – Unit Masonry at sheathing substrates.

### 3.6 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Glass-Fiber: Install in cavities formed by framing members according to the following requirements:
  - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
  - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

### 3.7 INSTALLATION OF SPRAY-APPLIED INSULATION

- A. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
  - 1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.



2. Apply intumescent paint to all sprayed polyurethane insulation exposed to the building interior and ceiling space to provide a complete thermal barrier.

### 3.8 INSTALLATION OF CLADDING ATTACHMENT SYSTEM AND INSULATION

- A. Install girts, spacers, and framing in accordance with manufacturer's written installation instructions.
- B. Do not overtighten screw fasteners to avoid crushing sheathing and damaging air barrier membrane.
- C. Install girts, spacers and framing to fill in exterior continuous insulation spaces without gaps or voids. Do not compress insulation panels.
- D. Trim insulation neatly to fit spaces and insulate miscellaneous gaps and voids.
- E. Install mineral-wool board insulation snugly around and between supports as recommended by attachment system manufacturer.

### 3.9 INSTALLATION OF PRESSURE INJECTED FOAM INSULATION

- A. When wall sections are complete, sealed or closed, Cor-Fill 500 is pressure-injected into each vertical cavity through a small installation hole drilled in the mortar joints horizontally around the entire wall and every 8 inches on center and approximately 5 feet from the floor and every 10 feet vertically until the wall is filled-or as determined by the certified installer. This allows the mason contractor to work uninterrupted during the construction of each wall.
- B. Fill holes with mortar to match adjacent mortar when complete.

### 3.10 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100



## SECTION 072500 - WEATHER BARRIERS

### 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. Weather barrier under fiber-reinforced cementitious wall panels.

#### 1.3 ACTION SUBMITTALS

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

- 1. For weather barrier, include data on air and water-vapor permeance based on testing according to referenced standards.

- B. Shop Drawings: Show details of weather barrier at terminations, openings, and penetrations. Show details of transition tape applications.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For water-resistive barrier, from ICC-ES.

### PART 2 - PRODUCTS

#### 2.1 WEATHER BARRIER

- A. Basis-of-Design Product: Subject to compliance with requirements, provide VaproShield; RevealShield SA Self-Adhered air barrier membrane for open-joint rain screen cladding systems, or comparable product by one of the following:

- 1. Delta; Dorken Group.

- B. Water-Vapor Permeance: Minimum of 63 perms per ASTM E 96 Method B.

- C. Air Leakage: 0.00002 cfm/s.f. at 1.57 psf when tested according to ASTM E 2178.

## WEATHER BARRIERS

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- D. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.
- E. ASTM E84 Class A rating.
- F. Color: Black, UV stable, 12 months 100% exposure prior to coverage with an open joint cladding.
- G. Weather Barrier Transition Tape: Pressure-sensitive plastic tape recommended by weather barrier manufacturer for sealing joints and penetrations in weather barrier and transitions to adjoining surfaces.

### PART 3 - EXECUTION

#### 3.1 WEATHER BARRIER INSTALLATION

- A. Cover exposed exterior surface of substrate with weather barrier securely fastened to framing immediately after substrate is installed.
- B. Cover substrate with weather barrier as follows:
  - 1. Cut back barrier 1/2 inch (13 mm) on each side of the break in supporting members at expansion- or control-joint locations.
  - 2. Apply barrier to cover vertical flashing with a minimum 4-inch (100-mm) overlap unless otherwise indicated.
- C. Weather Barrier: Comply with manufacturer's written instructions and warranty requirements.
  - 1. Seal seams, edges, fasteners, and penetrations with tape.
  - 2. Extend into jambs of openings and seal corners with tape.

END OF SECTION 072500

## SECTION 072726 - FLUID-APPLIED MEMBRANE AIR BARRIERS

### 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. This Section includes the following:
  - 1. Fluid-applied membrane air barrier, vapor retarding.
  - 2. Fluid-applied membrane air barrier, vapor permeable.
- B. Related Sections include the following:
  - 1. Section 042000 "Unit Masonry" for embedded flashings.
  - 2. Section 061600 "Sheathing" for substrates over which air barriers are applied.
  - 3. Section 076200 "Sheet Metal Flashing and Trim" for sheet metal flashings.
  - 4. Section 079200 "Joint Sealants" for joint-sealant materials and installation.

#### 1.3 DEFINITIONS

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

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier. Air barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air Barrier Assembly Air Leakage: Not to exceed 0.03 cfm x sq. ft. of surface area at 1.57 lbf/sq. ft. (0.15 L/s x sq. m of surface area at 75 Pa); ASTM E 283.

## 1.5 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of air barrier.
- B. Shop Drawings: Show locations and extent of air barrier. Include details for substrate joints and cracks, counterflashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
  - 1. Include details of interfaces with other materials that form part of air barrier.
- C. Product Certificates: For air barriers, certifying compatibility of air barrier and accessory materials with Project materials that connect to or that come in contact with the barrier; signed by product manufacturer.
- D. Qualification Data: For Applicator.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for air barriers.
- F. Field inspection reports by manufacturer's authorized representative.

## 1.6 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm experienced in applying air barrier materials similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance and that is an ABAA-licensed contractor, employs certified and registered installers, and complies with ABAA's Quality Assurance Program.
- B. Mockups: Before beginning installation of air barrier, build mockup of exterior wall assembly, reference Specification Section 042000 for size of mockup, incorporating backup wall construction, external cladding, window, door frame and sill, insulation, and flashing to demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of air barrier membrane.
  - 1. Include junction with roofing membrane, building corner condition, and foundation wall intersection.
  - 2. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.
- C. Preinstallation Conference: Conduct conference at Project site with manufacturer's authorized field representative.
  - 1. Include installers of other construction connecting to air barrier, including roofing, waterproofing, architectural precast concrete, masonry, sealants, windows, glazed curtain walls, and door frames.

2. Review air barrier requirements including surface preparation, substrate condition and pretreatment, minimum substrate curing period, forecasted weather conditions, special details and sheet flashings, mockups, installation procedures, sequence of installation, testing and inspecting procedures, and protection and repairs.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier manufacturer.
- B. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- C. Store rolls according to manufacturer's written instructions.
- D. Protect stored materials from direct sunlight.

#### 1.8 PROJECT CONDITIONS

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

### PART 2 - PRODUCTS

#### 2.1 FLUID-APPLIED MEMBRANE AIR BARRIER

- A. Fluid-Applied, Vapor-Retarding Membrane Air Barrier: Elastomeric, modified bituminous or synthetic polymer membrane.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Elastomeric, Modified Bituminous Membrane:
      - 1) Carlisle Coatings & Waterproofing; Barriseal.
      - 2) Henry Company; Air-Block 06.
      - 3) Tremco Incorporated; ExoAAir 120.
  2. Physical and Performance Properties:
    - a. Membrane Vapor Permeance: Not to exceed 0.1 perm (5.8 ng/Pa x s x sq. m); ASTM E 96.
    - b. Membrane Air Permeance: Not to exceed 0.004 cfm x sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa.) pressure difference; ASTM E 2178.

- B. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: Elastomeric, modified bituminous or synthetic polymer membrane.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. Elastomeric, Modified Bituminous Membrane:

- 1) Henry Company; Air-Block 07.
- 2) Meadows, W.R., Inc.; Sealtight Air-Shield LMP.
- 3) Tremco; ExoAir 220.

2. Physical and Performance Properties:

- a. Membrane Air Permeance: Not to exceed 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. (0.02 L/s x sq. m of surface area at 75-Pa) pressure difference; ASTM E 2178.
- b. Membrane Vapor Permeance: Not less than 10 perms (580 ng/Pa x s x sq. m); ASTM E 96.

## 2.2 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by air barrier manufacturer for intended use and compatible with air barrier membrane. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid waterborne primer recommended for substrate by manufacturer of air barrier material.
- C. Counterflashing Strip: Modified bituminous, 40-mil- (1.0-mm-) thick, self-adhering sheet consisting of 32 mils (0.8 mm) of rubberized asphalt laminated to an 8-mil- (0.2-mm-) thick, crosslaminated polyethylene film with release liner backing.
- D. Butyl Strip: Vapor-retarding, 30- to 40-mil- (0.76- to 1.0-mm-) thick, self-adhering; polyethylene-film-reinforced top surface laminated to layer of butyl adhesive with release liner backing.
- E. Joint Reinforcing Strip: Air barrier manufacturer's glass-fiber-mesh tape.
- F. Substrate Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- G. Adhesive and Tape: Air barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- H. Sprayed Polyurethane Foam Sealant: 1- or 2-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft (24 to 32 kg/cu. m) density; flame spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.



- I. Modified Bituminous Transition Strip: Vapor-retarding, 40-mil- (1.0-mm-) thick, smooth-surfaced, self-adhering; consisting of 36 mils (0.9 mm) of rubberized asphalt laminated to a 4-mil- (0.1-mm-) thick polyethylene film with release liner backing.
- J. Adhesive-Coated Transition Strip: Vapor-permeable, 17-mil- (0.43-mm-) thick, self-adhering strip consisting of an adhesive coating over a permeable laminate with a permeance of 37 perms (2145 ng/Pa x s x sq. m).
- K. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low-modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 079200 "Joint Sealants."
- L. Elastomeric Flashing Sheet: ASTM D2000, 2BC415 to 3BC620, minimum 50 to 65 mil. (1.3 to 1.6 mm) thick, cured sheet neoprene with manufacturer's recommended contact adhesives and lap sealant with stainless-steel termination bars and fasteners.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
  - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
  - 2. Verify that masonry joints are flush and completely filled with mortar.
  - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate patching membrane.
- D. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.

### 3.3 JOINT TREATMENT

- A. Masonry: Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 1193 and air barrier manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces with vapor retarding fluid applied air barrier membrane.
  - 1. Prime substrate and apply a single thickness of preparation coat strip extending a minimum of 3 inches (75 mm) along each side of joints and cracks. Apply a double thickness of vapor-retarding air barrier membrane and embed a joint reinforcing strip in preparation coat.
- B. Gypsum Sheathing: Fill joints greater than 1/4 inch (6 mm) with sealant according to ASTM C 1193 and with air barrier manufacturer's written instructions. Apply first layer of vapor permeable fluid air barrier membrane at joints. Tape joints with joint reinforcing strip after first layer is dry. Apply a second layer of vapor permeable fluid air barrier membrane over joint reinforcing strip.

### 3.4 TRANSITION STRIP INSTALLATION

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

(75 mm) of coverage is achieved over both substrates. Maintain 3 inches (75 mm) of full contact over firm bearing to perimeter frames with not less than 1 inch (25 mm) of full contact.

1. Modified Bituminous and Adhesive-Coated Transition Strip: Roll firmly to enhance adhesion.
- G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, doors, miscellaneous penetrations of air barrier membrane with foam sealant and other transitions indicated in drawings.
- H. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- I. Seal top of through-wall flashings to air barrier with an additional 6-inch- (150-mm-) wide, counterflashing strip.
- J. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- K. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches (150 mm) beyond repaired areas in strip direction.
- L. Install transition membranes over all adjacent vertical metal flashings to ensure proper weather lap.
- M. Building Expansion Joints: Install elastomeric flashing sheet with termination bars at building expansion joints.

### 3.5 AIR BARRIER MEMBRANE INSTALLATION

- A. Apply air barrier membrane to form a seal with strips and transition strips and to achieve a continuous air barrier according to air barrier manufacturer's written instructions.
- B. Apply air barrier membrane within manufacturer's recommended application temperature ranges.
- C. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by air barrier sheet in same day. Reprime areas exposed for more than 24 hours.
- D. Apply a continuous unbroken air barrier to substrates according to the following minimum thickness. Apply membrane in full contact around protrusions such as masonry ties.
  1. Vapor-Retarding Membrane Air Barrier: 60-mil (1.5-mm) dry film thickness.
    - a. Apply to concrete masonry substrates.

2. Vapor-Permeable Membrane Air Barrier: Dry film thickness recommended by manufacturer.
  - a. Apply to metal-framed and sheathed substrates.
- E. Apply strip and transition strip a minimum of 1 inch (25 mm) onto cured air membrane or strip and transition strip over cured air membrane overlapping 3 inches (75 mm) onto each surface according to air barrier manufacturer's written instructions.
- F. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- G. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air barrier components.

### 3.6 CLEANING AND PROTECTION

- A. Protect air barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
  1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. Remove and replace air barrier exposed for more than 30 days.
  2. Protect air barrier from contact with creosote, uncured coal-tar products, TPO, EPDM, flexible PVC membranes, and sealants not approved by air barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.
- C. Remove masking materials after installation.

### 3.7 FIELD QUALITY CONTROL

- A. Manufacturer's authorized field representatives to conduct an inspection of completed membrane air barrier assembly and submit report to Architect. Deficiencies shall be remedied by applicator prior to cladding with exterior facing materials.
- B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections shall include the following:
  1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
  2. Continuous structural support of air-barrier system has been provided.
  3. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
  4. Site conditions for application temperature and dryness of substrates have been maintained.
  5. Maximum exposure time of materials to UV deterioration has not been exceeded.
  6. Surfaces have been primed, if applicable.

7. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
8. Termination mastic has been applied on cut edges.
9. Strips and transition strips have been firmly adhered to substrate.
10. Compatible materials have been used.
11. Transitions at changes in direction and structural support at gaps have been provided.
12. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
13. All penetrations have been sealed.

END OF SECTION 072726



## SECTION 074160 – FIBER-REINFORCED CEMENTITIOUS WALL PANELS

### 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. This Section includes fiber-reinforced cementitious wall panels including the following:
  - 1. Fiber cement/concrete panels.
  - 2. Fasteners
  - 3. Sheet metal flashing and trim.
  - 4. Accessories.
- B. Related Sections include the following:
  - 1. Section 072100 "Thermal Insulation" for the cladding attachment system and mineral-wool board insulation installed behind fiber cement panels.
  - 2. Section 072500 "Weather Barriers" for weather barrier installed behind fiber cement panels.

#### 1.3 REFERENCES

- A. American Society of Testing and Materials (ASTM):
  - 1. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM C 1186 Standard Specification for Flat Non-Asbestos Fiber-Cement Sheets.
  - 3. ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 4. ASTM E 228 Standard Test Method for Linear Thermal Expansion of Solid Materials with a Vitreous Silica Dilatometer (Withdrawn 2005)
  - 5. ASTM G 155 Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials.

#### 1.4 DEFINITIONS

- A. Fiber Cement Panel Assembly: Fiber-reinforced cementitious wall panels, fasteners, and accessories.

## 1.5 PERFORMANCE REQUIREMENTS

- A. General: Provide wall panels that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
- B. Design wall panels, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- C. Structural Performance: Provide wall panels capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 330.
  - 1. Wind Loads: Determine loads based on the following minimum design wind pressures:
    - a. Uniform pressure of 30 psf acting inward or outward.
  - 2. Deflection limits: Wall panels shall withstand wind loads with horizontal deflections no greater than 1/300 of the span anywhere in the panel.
- D. Thermal Movements: Provide wall panel assemblies that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): -40 deg F up to 176 deg F.
- E. Panel to framing fastener spacing shall be calculated when support system is designed. Support system shall be capable of supporting system in accordance with requirements of this section and those of good engineering practice.

## 1.6 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 type of wall panel and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish between factory and field-assembled work. Show complete building elevation with all panels and joints completely dimensioned.
  - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - 2. Include details of furring at a scale of not less than 1-1/2 inches per foot.



- C. Coordination Drawings: Exterior elevations drawn to scale and coordinating penetrations and wall-mounted items. Show the following:
  - 1. Wall panels and attachments.
  - 2. Girts and stud framing.
  - 3. Wall-mounted items including doors, windows, louvers and lighting fixtures.
  - 4. Fire alarm notification devices.
  - 5. Penetrations of walls by pipes and utilities and service items/connections.
- D. Samples for Verification: For each type of exposed finish required, prepared on samples of size indicated below.
  - 1. Wall Panels: 12 inches long by actual panel width. Include fasteners, closures, and other wall panel accessories.
  - 2. Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.
  - 3. Accessories: 12-inch long samples for each type of accessory.
- E. Qualification Data: For Installer and professional engineer.
- F. Material Certificates: Signed by manufacturers.
- G. Field quality-control test reports.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for the following:
  - 1. Wall Panels: Include reports for air fire-test-response characteristics and structural performance.
- I. Maintenance Data: For wall panels to include in maintenance manuals.
- J. Warranties: Special warranties specified in this Section.

## 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
  - 1. Installer's responsibilities include fabricating and installing wall panels and providing professional engineering service needed to assume engineering responsibility.
  - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Source Limitations: Obtain each type of wall panel through one source from a single manufacturer.
- C. Product Options: Drawings indicate size, profiles, and dimensional requirements of wall panels and are based on the specific system indicated.

1. Do not modify intended aesthetic affects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
  - D. Surface-Burning Characteristics: Provide wall panels with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
    1. Flame-Spread Index: 25 or less, unless otherwise indicated.
    2. Smoke-Developed Index: 450 or less, unless otherwise indicated.
  - E. Mockups: Build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.
    1. Build mockup of typical corner wall panel as shown on visual and technical test mockup Drawing; by full thickness, including supports, attachments, and accessories.
    2. Include four-way joint for fiber cement wall panels
    3. Approval of mockups is for other material and construction qualities specifically approved by Architect in writing.
    4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
    5. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
  - F. Preinstallation Conference: Conduct conference at jobsite. Review methods and procedures related to wall panel assemblies including, but not limited to, the following:
    1. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
    2. Review flashings, penetrations, openings, etc. that will affect wall panels.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Deliver components, sheets, wall panels, and other manufactured items so as not to be damaged or deformed. Package wall panels for protection during transportation and handling.
  - B. Unload, store, and erect wall panels in a manner to prevent bending, warping, twisting, and surface damage.
  - C. Stack fiber cement panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store wall panels inside to ensure dryness. Do not store wall panels in contact with other materials that might cause staining, denting, or other surface damage.

1.9 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of wall panels to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before wall panel fabrication and indicate measurements on Shop Drawings.

1.10 COORDINATION

- A. Coordinate wall panel assemblies with rain drainage work, flashing, trim, and construction of girts, studs, soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

- A. Special Panel Warranty: Form is included at the end of this section in which installer agrees to repair or replace components of exterior enclosure systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.

1. Failures include, but are not limited to, the following:

- a. Structural failures including, but not limited to, excessive deflection.
- b. Noise or vibration caused by thermal movements.
- c. Failure of panels to meet performance requirements.
- d. Deterioration of panels, panel finishes, and other materials beyond normal weathering.
- e. Corrosion of fasteners.

2. Warranty Period: Ten (10) years from date of Substantial Completion.

- B. Panel Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of wall panels that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

- a. Structural failures, including rupturing, cracking, or puncturing.
- b. Deterioration of finishes, and other materials beyond normal weathering.

2. Warranty Period:

- a. Ten (10) years from date of Substantial Completion for fiber cement panels and support system.

- C. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

## 1.12 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. Fiber Cement Panels: 5% of each type/color, in unbroken bundles.
  - 2. Fasteners: 5% of each type/color

## PART 2 - PRODUCTS

### 2.1 PANEL MATERIALS

- A. Fiber-Cement Panels: Provide wall panels factory-fabricated from single sheets and cut into shapes and sizes and drilled for installation method indicated. Include attachment system components and accessories required for system.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. American Fiber Cement Corp.
    - b. Swisspearl.
  - 2. Panel Material: Cement, silicon-calcium strengthened with a combination polyvinyl and cellulose fibers without asbestos, fiberglass or formaldehyde complying with ASTM C 1186, Type A, Grade III. Panels reinforced with only cellulose fibers will not be accepted.
  - 3. Fire Resistive Rating: noncombustible, UBC Class 1, NFPA Class A, per ASTM E 136 (VTEC Lab. NY).
  - 4. Panels shall be classified as noncombustible when tested according to ASTM E 136; and has a flame-spread index of 25 or less when tested according to ASTM E 84.
  - 5. Freeze Thaw Resistance: At least 80 percent flexural strength retained, when tested in accordance with ASTM C 1185.
  - 6. UV Resistance: No cracking, checking, or erosion, where tested for 2000 hours in accordance with ASTM G 155.
  - 7. Thickness: 8 mm (5/16 inch).
  - 8. Colors:
    - a. CP-1: American Fiber Cement Cembrit Solid: S-212 Luna.
    - b. CP-2: American Fiber Cement Cembrit Solid: S-101 Pluto.
  - 9. Reflex-finished panels to be manufactured in one run and oriented all alike.
- B. Panel Sealants:

1. Do not use sealants where they will contact fiber cement panels.
- C. Attachment System Components: Formed from stainless steel or extruded aluminum.
  1. Include insect screens; inside and outside backer angle plates; as recommended by fiber cement panel manufacturer.
  2. Alignment Pins: Stainless steel.
- D. Flashing and Trim: As specified in Section 076200 "Sheet Metal Flashing and Trim."

## 2.2 FASTENERS

- A. Panel fastening shall be designed and engineered by Contractor to meet performance requirements as stated in these specifications and on the Drawings.

## 2.3 MISCELLANEOUS MATERIALS

- A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide manufacturer's exposed fasteners with heads matching color of wall panels by means of factory-applied coating.
  1. Fasteners for Wall Panels: Flat-profile, self-drilling or self-tapping 410 stainless steel rivets, with EPDM or PVC washer under heads of fasteners bearing on weather side of wall panels, prefinished to match panel color.

## 2.4 ACCESSORIES

- A. Wall Panel Accessories: Provide outside and inside corner metal backer plates as recommended by the panel's manufacturer.
- B. Spray or Roll Applied Coating: Provided spray or roll applied coating on attachment system components where for fiber reinforced cementitious wall panels that are exposed to view between the rainscreen joint system. Refer to Drawings for location.
  1. Manufacturers: Subject to compliance with requirements, provide one of the following:
    - a. Dow Corning; All Guard.
    - b. Dow Corning; Defend Air 200.
    - c. Momentive; SEC2600 SilShield AWB.
    - d. Prosoco; R-Guard Cat 5 Rain Screen.
  2. Color: Black.
  3. Installation: Per manufacturer's recommendation for use over the attachment system components.

## 2.5 FABRICATION

- A. General: Fabricate and finish wall panels and accessories at the factory by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
  - 1. Form panel lines, breaks, and angles to be sharp and true, with surfaces free from warp and buckle.
  - 2. Fabricate wall panels with panel stiffeners as required to maintain fabrication tolerances and to withstand design loads.
  - 3. Fabrication includes drilling holes for fasteners and other penetrations.
- B. Fiber Cement Wall Panels: Fabricate panels with panel stiffeners as required to comply with deflection limits. Corners shall be smooth. Fabricate panels to the following dimensional tolerances:
  - 1. Length and Width:  $\pm 0.032$  inch up to 48 inches; 0.064 inch more than 48 inches.
  - 2. Diagonal:  $\pm 0.1875$  inch
  - 3. Panel Bow: Not more than 0.2 percent of panel width or length up to 0.1875 inch maximum.
  - 4. Thickness:  $\pm 0.008$  inch.
  - 5. Squareness: 0.1875-inch difference between diagonal measurements.
  - 6. Camber: 0.032 inch.

## 2.6 FINISHES, GENERAL

- A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. 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.
- C. Paint all corner backer plates, and all materials that will be visible between panel joints, flat black.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, wall panel supports, and other conditions affecting performance of work.

1. Examine primary and secondary wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by wall panel manufacturer.
  2. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
- B. Examine roughing-in for components and systems penetrating wall panels to verify actual locations of penetrations relative to seam locations of wall panels before wall panel installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean substrates of substances harmful to materials.
- B. Install flashings and other sheet metal to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."
- C. Install fasciae and copings to comply with requirements specified in Section 076200 "Sheet Metal Flashing and Trim."

### 3.3 PANEL INSTALLATION, GENERAL

- A. General: Install wall panels in orientation, sizes, and locations indicated on Drawings. Install panels to girts and subgirts provided as specified in Section 072100 "Thermal Insulation". Anchor panels and other components of the Work securely in place, with provisions for thermal and structural movement. All cutting, drilling and sealing of fiber cement panels shall be executed as indicated in manufacturer's written installation instructions.
1. Field cutting of wall panels by torch is not permitted.
  2. Shim or otherwise plumb substrates receiving wall panels.
  3. Do not begin installation until weather barrier underlayment and flashings that will be concealed by wall panels are installed.
  4. Install screw fasteners in predrilled holes.
- B. Fasteners:
1. Fiber Cement Wall Panels: Pre-finished stainless steel.
- C. 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 wall panel manufacturer.

### 3.4 WALL PANEL INSTALLATION

- A. Back Ventilated Rainscreen-Principle Installation:

1. Install wall panels to allow individual panels to “free float” and be installed and removed without disturbing adjacent panels.
2. Do not apply sealants to joints, unless otherwise indicated on Drawings.

### 3.5 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate with other components.
- B. Flashing and Trim: Comply with SMACNA and manufacturer's written installation instructions. Provide concealed fasteners. Install work with laps, joints, and seams that will be permanently watertight and weather resistant. Provide for thermal expansion.

### 3.6 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align wall panel units within installed tolerance of 1/4 inch in 20 feet, noncumulative, on level, plumb, and location lines as indicated and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

### 3.7 FIELD QUALITY CONTROL

- A. Remove and replace applications of wall panels where inspections indicated that they do not comply with specified requirements.
- B. Final Wall Panel Inspection: Arrange for wall panel system manufacturer's factor-authorized representative to inspect wall panel installation on completion and submit report to Architect.
  1. Notify Architect and Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of wall panel system where inspections indicate that they do not comply with specified requirements.
- D. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.8 CLEAN AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as wall panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of wall panel installation, clean finished surfaces as recommended by wall panel manufacturer. Maintain in a clean condition during construction.
- B. Replace wall panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.



3.9 EXTERIOR ENCLOSURE INSTALLER'S AND MANUFACTURER'S WARRANTY

- A. WHEREAS (Name)\_\_\_\_\_ of  
(Address)\_\_\_\_\_, herein called the  
"Enclosure Installer," has performed roofing and associated work ("work") on the following  
project:
1. Owner: \_\_\_\_\_
  2. Address: \_\_\_\_\_
  3. Building Name/Type: \_\_\_\_\_
  4. Address: \_\_\_\_\_
  5. Area of Work: \_\_\_\_\_
  6. Acceptance Date: \_\_\_\_\_
  7. Warranty Period: \_\_\_\_\_
  8. Expiration Date: \_\_\_\_\_
- B. AND WHEREAS Enclosure 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 Enclosure 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. peak gust wind speed exceeding 75 mph;
    - c. fire;
    - d. failure of panel 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 exterior enclosure 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 Enclosure Installer and until cost and  
expense thereof has been paid by Owner or by another responsible party so designated.
  3. The Enclosure Installer is responsible for damage to work covered by this Warranty and  
is liable for consequential damages to building or building contents, resulting from leaks  
or faults or defects of work. Remedial work shall be performed within a 24-hour period  
following notification.

4. During Warranty Period, if Owner allows alteration of work by anyone other than Enclosure Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on enclosure, 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 Enclosure Installer to perform said alterations, Warranty shall not become null and void, unless Enclosure 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 enclosure is changed and it becomes used for 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. The Owner shall promptly notify Enclosure Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Enclosure 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 Enclosure 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 enclosure failure. Specifically, this Warranty shall not operate to relieve Enclosure 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.

E. IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_ day of (month)\_\_\_\_\_20\_\_.

1. Authorized Signature:
2. Name:
3. Title:

END OF SECTION 074160

## SECTION 074231.13 – FORMED METAL SOFFIT PANELS

### 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. Metal soffit panels (MSP-2).
- B. Related Sections:
  - 1. Section 054000 "Cold-Formed Metal Framing" for support framing, including girts, studs, and bracing.
  - 2. Section 076200 "Sheet Metal Flashing and Trim" for flashing and other sheet metal work that is not part of metal soffit panel assemblies.

#### 1.3 DEFINITION

- A. Metal Soffit Panel Assembly: Metal soffit panels, attachment system components, miscellaneous metal framing, and accessories necessary for a complete soffit system.

#### 1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal soffit panel assemblies shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Structural Performance: Provide metal soffit panel assemblies capable of withstanding the effects the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:
  - 1. Wind Loads: Determine loads based on the following minimum design wind pressures:
    - a. Uniform pressure of 20 lbf/sq. ft. (957 Pa), acting inward or outward.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint

sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

## 1.5 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 type of soffit panel and accessory.
- B. Shop Drawings: Show fabrication and installation layouts of metal soffit panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish between factory-, shop- and field-assembled work.
  1. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:10):
    - a. Flashing and trim.
    - b. Anchorage systems.
- C. Samples for Initial Selection: For each type of metal soffit panel indicated with factory-applied color finishes.
  1. Include manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each sealant exposed to view.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.
- F. Warranties: Sample of special warranties.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- C. Source Limitations: Obtain each type of metal soffit panel from single source from single manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal soffit panels, and other manufactured items so as not to be damaged or deformed. Package metal soffit panels for protection during transportation and handling.
- B. Unload, store, and erect metal soffit panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal soffit panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal soffit panels to ensure dryness, with positive slope for drainage of water. Do not store metal soffit panels in contact with other materials that might cause staining, denting or other surface damage.
- D. Retain strippable protective covering on metal soffit panel for period of metal soffit panel installation.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal soffit panels to be performed according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Verify locations of structural members and soffit opening dimensions by field measurements before metal soffit panel fabrication and indicate measurements on Shop Drawings.

1.9 COORDINATION

- A. Coordinate metal soffit panel assemblies with rain drainage work, flashing, trim, and construction of studs, soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.10 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal soffit panel assemblies that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including rupturing, cracking, or puncturing.
    - b. Deterioration of metals and other materials beyond normal weathering.
  - 2. Warranty Period: Two years from date of Substantial Completion.

- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal soffit panels that show 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 PANEL MATERIALS

- A. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
  2. Surface: Smooth, flat finish.
  3. Exposed Coil-Coated Finish:
    - a. 2-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  4. Concealed Finish: Apply pretreatment and 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).
- B. Panel Sealants:
1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
  2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal soffit panels and remain weathertight; and as recommended in writing by metal soffit panel manufacturer.
  3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

## 2.2 MISCELLANEOUS MATERIALS

- A. Panel Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal wall panels by means of plastic caps or factory-applied coating. Provide EPDM, PVC, or neoprene sealing washers.

## 2.3 CONCEALED-FASTENER, LAP-SEAM METAL SOFFIT PANELS

- A. General: Provide factory-formed metal soffit panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners and factory-applied sealant in side laps. Include accessories required for weathertight installation.
- B. Flush-Profile, Concealed-Fastener Metal Soffit Panels MSP-2: Formed with vertical panel edges and Intermediate stiffening ribs or vee-grooves symmetrically spaced between panel edges; with flush joint between panels.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Berridge Manufacturing Company; Vented FW-12, or comparable product by one of the following:
    - a. AEP-Span.
    - b. ATAS International, Inc.
    - c. CENTRIA Architectural Systems.
    - d. Dimension Metals, Inc.
    - e. Fabral.
    - f. MBCI; Div. of NCI Building Systems.
    - g. Metal-Fab Manufacturing, L.L.C.
    - h. Metecno-Morin.
    - i. Petersen Aluminum Corporation.
  - 2. Material: Zinc-coated (galvanized) steel sheet, 24-gauge.
    - a. Exterior Finish: 2-coat fluoropolymer.
    - b. Color: As selected by Architect from manufacturer's full range.
  - 3. Panel Coverage: 12 inches nominal.
  - 4. Panel Height: 1-1/2 inch.
  - 5. Vented.

## 2.4 ACCESSORIES

- A. Soffit Panel Accessories: Provide components required for a complete metal soffit panel assembly including trim, clips, flashings, sealants, gaskets, fillers, and similar items.
- B. Flashing and Trim: Formed from 0.018-inch (0.46-mm) minimum thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance.

## 2.5 FABRICATION

- A. General: Fabricate and finish metal soffit panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. Fabricate metal soffit panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.
- C. Provide panel profile, including major ribs and intermediate stiffening ribs, for full length of panel.
- D. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.
  - 1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
  - 2. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
  - 3. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
  - 4. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by metal wall panel manufacturer.
    - a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

## 2.6 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 and painted 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.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal soffit panel supports, and other conditions affecting performance of work.
  - 1. Examine soffit framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
- B. Examine roughing-in for components and systems penetrating metal wall panels to verify actual locations of penetrations relative to seam locations of metal soffit panels before metal soffit panel installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Miscellaneous Framing: Install subgirts, and other miscellaneous soffit panel support members and anchorages according to ASTM C 754 and metal wall panel manufacturer's written recommendations.

#### 3.3 METAL SOFFIT PANEL INSTALLATION

- A. General: Install metal soffit panels according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts and subgirts unless otherwise indicated. Anchor metal soffit panels and other components of the Work securely in place, with provisions for thermal and structural movement.
  - 1. Shim or otherwise plumb substrates receiving metal wall panels.
  - 2. Flash and seal metal wall panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until weather barrier and flashings that will be concealed by metal wall panels are installed.
  - 3. Install screw fasteners in predrilled holes.

4. Install flashing and trim as metal soffit panel work proceeds.
5. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
6. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete and elsewhere as indicated or, if not indicated, as necessary for waterproofing.
7. Align bottom of metal soffit panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe and conduit penetrating exterior walls.

B. Fasteners:

1. Use stainless-steel fasteners for surfaces exposed to the exterior.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action as recommended by metal soffit panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weathertight performance of metal soffit panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal soffit panel manufacturer.

1. Seal metal soffit panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal soffit panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

E. Provide metal soffit panels full width of soffits. Install panels perpendicular to support framing.

1. Flash and seal panels with weather closures where metal soffit panels meet walls and at perimeter of all openings.

### 3.4 ACCESSORY INSTALLATION

A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal soffit panel assembly including trim, flashings, and similar items.

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.

3.5 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal soffit panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal soffit panel installation, clean finished surfaces as recommended by metal soffit panel manufacturer. Maintain in a clean condition during construction.
- B. After metal soffit panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.
- C. Replace metal soffit panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 074213



## SECTION 074600 - ALUMINUM SOFFIT PANELS

### 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. Aluminum soffit panels: MSP-1.
- B. Related Requirements:
  - 1. Section 054000 "Cold-Formed Metal Framing for sheet metal strapping attached to framing members for attaching wall panels.

#### 1.3 COORDINATION

- A. Coordinate siding installation with flashings and other adjoining construction to ensure proper sequencing.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Samples for Verification: For each type, color, texture, and pattern required.
  - 1. 12-inch- (300-mm-) long-by-actual-width Sample of siding.
  - 2. 12-inch- (300-mm-) long-by-actual-width Sample of soffit.
  - 3. 12-inch- (300-mm-) long-by-actual-width Sample of batten.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of aluminum wall and soffit panel, and batten.
- B. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of product, including related accessories, to include in maintenance manuals.

1.7 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 mockups for wall and soffit panels including accessories.
    - a. Size: 48 inches (1200 mm) long by 60 inches (1800 mm) high.
    - b. Include outside corner on one end of mockup and inside corner on other end.
  - 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.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with labels intact until time of use.
- B. Store materials on elevated platforms, under cover, and in a dry location.

1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace products that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures including cracking, fading, and deforming.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Fading is defined as loss of color, after cleaning with product recommended by manufacturer, of more than 7 Hunter color-difference units as measured according to ASTM D2244.
  - 3. Warranty Period: 15 years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain products, including related accessories, from single source from single manufacturer.

### 2.2 EXTRUDED SOFFIT PANELS

- A. Aluminum Panels (MSP-1): Manufacturer's standard extruded aluminum, alloy 6063 T5.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Longboard Products; a Mayne Inc. company, V Groove Panels or comparable product by one of the following:
    - a. Dizal, Inc.
    - b. Knotwood; a division of OmniMax International, Inc. North America.
- B. Panel Width: 6 inches (152 mm).
- C. Panel Depth: 7/16 inch (11.4 mm).
- D. Assembly: Interlocking butt jointed.
- E. Texture: Wood grain.
- F. Nominal Base Metal Thickness: 0.06 inch (1.52 mm).
- G. Finish: Manufacturer's standard primer and baked-on polyester to simulate wood grain.
  - 1. Color: Light Fir.

### 2.3 ACCESSORIES

- A. Panel Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.
  - 1. Provide accessories made from same material as and matching color and texture of adjacent wall and soffit panels unless otherwise indicated.
- B. Aluminum Accessories: Where aluminum accessories are indicated, provide accessories complying with AAMA 1402.
  - 1. Texture: Wood grain.
  - 2. Nominal Thickness: 0.024 inch (0.6 mm).
  - 3. Finish: Manufacturer's standard primer and baked-on polyester.

- C. Flashing: Provide aluminum flashing complying with Section 076200 "Sheet Metal Flashing and Trim" at window and door heads and where indicated.
- D. Fasteners:
  - 1. For fastening to metal, use ribbed bugle-head screws of sufficient length to penetrate a minimum of 1/4 inch (6 mm), or three screw-threads, into substrate.
  - 2. For fastening aluminum, use aluminum fasteners. Where fasteners are exposed to view, use prefinished aluminum fasteners in color to match item being fastened.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of aluminum wall and soffit panels and related accessories.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.

#### 3.3 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Install aluminum wall and soffit panels, battens, and related accessories according to manufacturer's written instructions.
  - 1. Install fasteners no more than 24 inches (600 mm) o.c.
- C. Install joint sealants as specified in Section 079200 "Joint Sealants" and to produce a weathertight installation.
- D. Where aluminum siding contacts dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.

#### 3.4 ADJUSTING AND CLEANING

- A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.



- B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 074616



## SECTION 075213 - MODIFIED BITUMINOUS MEMBRANE ROOFING

### 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. Modified bituminous membrane roofing.
  - 2. Roof insulation.
- B. Section includes the installation of insulation strips and spacers in ribs of acoustical roof deck. Insulation strips are furnished under Section 053100 "Steel Decking."
- C. Related Requirements:
  - 1. Section 072100 "Thermal Insulation" for insulation beneath the roof deck.
  - 2. Section 076200 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
  - 3. Section 079200 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.
  - 4. Section 221423 "Storm Drainage Piping Specialties" for roof drains.

#### 1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" apply to Work of this Section.

#### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Roofing Conference: Conduct conference at Project site.
  - 1. Meet with Owner, Architect, Owner's roofing consultant, 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 materials and methods for mechanically fastening to metal deck.

4. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
5. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
6. Review structural loading limitations of roof deck during and after roofing.
7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects 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 roof observation and repair procedures after roofing installation.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other work, including:
  1. Base flashings and membrane terminations.
  2. Tapered insulation, including slopes.
  3. Crickets, saddles, and tapered edge strips, including slopes.
  4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- C. Samples for Verification: For the following products:
  1. Cap sheet, of color required.
  2. Flashing sheet, of color required.
  3. Walkway pads or rolls, of color required.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
  1. Submit evidence of compliance with performance requirements.
- C. Product Test Reports: For components of roofing system, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Research/Evaluation Reports: For components of roofing system, from ICC-ES.
- E. Field quality-control reports.

- F. Sample Warranties: For manufacturer's special warranties.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system to include in maintenance manuals.

#### 1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is UL listed or FM Global approved for membrane roofing system identical to that used for this Project.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

#### 1.9 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, approval or listing agency markings, 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.
  - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- 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.

#### 1.10 FIELD 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.

#### 1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, roofing accessories, and other components of roofing system.
  2. Warranty Period: 20 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 Installer, covering the Work of this Section, including all components of roofing system such as membrane roofing, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, and walkway products, for the following warranty period:
1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. DERBIGUM Americas, Inc.
  2. Firestone Building Products.
  3. Siplast, Inc.
  4. Soprema
- B. Source Limitations: Obtain components including roof insulation fasteners for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

### 2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing and base flashings shall remain watertight.
1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
  2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D 3746 or ASTM D4272.
- B. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. FM Global Listing: Roofing, base flashings, and component materials shall comply with requirements in FM Global 4450 or FM Global 4470 as part of a roofing system, and shall be

listed in FM Global' "RoofNav" for Class 1 or noncombustible construction, as applicable. Identify materials with FM Global markings.

1. Fire/Windstorm Classification: Class 1A-60.
  2. Hail-Resistance Rating: VSH.
- D. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- E. No product shall contain asbestos or asbestos-related products.

## 2.3 ROOFING SHEET MATERIALS

### A. Modified Bitumen Roof Membrane:

1. Two-ply modified bitumen membrane with polyester and/or glass fiber reinforcement, bottom ply shall be unsurfaced, top ply shall have a granular surface and be fire-rated. Granule color shall be selected by the Owner from the manufacturer's standard colors.
  - a. Products: Subject to compliance with requirements, provide one of the following:
    - 1) DERBIGUM Americas, Inc.; Derbibase Ultra and Derbicolor GP FR.
    - 2) Firestone Building Products; SBS Premium Base and SBS Premium FR.
    - 3) Siplast, Inc.; Paradiene 20 and Paradiene 30FR.
    - 4) Soprema, Inc.; Elastophene HR 2.2 and Sopralene 180 FR GR.

## 2.4 BASE FLASHING SHEET MATERIALS

### A. Two-Ply Base Flashings:

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. DERBIGUM Americas, Inc.; Derbibase and Derbicolor GP FR.
  - b. Firestone Building Products; SBS Premium Base and SBS Premium FR.
  - c. Siplast, Inc.; Paradiene 20 and Paradiene 40FR.
  - d. Soprema, Inc.; Elastophene HR 2.2 and Sopralene 180 FR GR.

## 2.5 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing.
- B. Roofing Adhesives:
1. Adhesive for Horizontal Applications:

- a. Products: Subject to compliance with requirements, provide one of the following:
  - 1) DERBIGUM Americas, Inc.; Permastic.
  - 2) Firestone Building Products; MB Cold Adhesive.
  - 3) Siplast, Inc.; PA-311M.
  - 4) Soprema, Inc.; Coldply Modified Adhesive.
2. Adhesive for Sloped and Vertical Applications:
  - a. Products: Subject to compliance with requirements, provide one of the following:
    - 1) DERBIGUM Americas, Inc.; Perflash.
    - 2) Firestone Building Products; MB Flashing Cement.
    - 3) Siplast, Inc.; PA-828 Flashing Cement.
    - 4) Soprema, Inc.; Coldply Flashing Cement.
- C. Asphalt Primer: ASTM D 41/D 41M.
- D. Reinforcing Fabric: Shall comply with ASTM D 1668-1.
- E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.
- F. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.
  1. Products: Subject to compliance with requirements, provide the following or approved equal:
    - a. Sealant for sealing flashing edges at set-on metal accessories shall be PS-209.
    - b. Elastomeric Sealant (slopes <1/4 inch per foot) or PS-715 NS.
    - c. Elastomeric Sealant (slopes >1/4 inch per foot) by Siplast, Inc.; MasterSeal NP 1 by BASF Building Systems.
- G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.
- H. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.
- I. Pitch Pan Filler:
  1. Sealant: Two component polyurethane pourable sealant as approved by the Owner's representative and manufacturer.
  2. Primer: Polyurethane primer as approved by the pourable sealant manufacturer.
  3. Grout: Quick-set, non-shrink, cementitious grout as approved by the Owner's representative and manufacturer.



J. Related Materials:

1. Lead flashing for roof drains shall be 27 inches by 27 inches and minimum 4 lb. lead.
2. Pipe or vent jackets shall be minimum 3 lb. lead with cap designed for use on flat roof construction.
3. Flashing securement devices shall be of adequate design to achieve substantial and positive anchorage.
  - a. Anchor bars for flashing securement to concrete or masonry substrates shall be 1/8-inch by 1-inch flat aluminum bar with 8-inch hole spacing by OMG, or approved equal.
  - b. Fasteners for securing anchor bars to concrete or masonry substrates shall be zinc alloy with stainless steel pin; Masonry Anchor by OMG, or approved equal.
  - c. Nails for flashing securement to wood substrates shall be stainless steel or zinc-coated type with 1-inch metal caps.

2.6 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated and that produce FM Global-approved roof insulation.
- B. Polyisocyanurate Board Insulation: Insulation shall be a closed-cell, polyisocyanurate foam core with polymer-bonded, fiberglass facers conforming to ASTM specification C 1289, Type II, Class 2. Foam core shall have a rated flame spread of 75 or less in accordance with ASTM E 84. Insulation shall have minimum compressive strength of 20 psi (Grade 2) in accordance with ASTM C 1289.
  1. Provide in overall thickness to achieve an R-value of 25 for the insulation only. Tapered insulation is not included in this R-value.
  2. Products: Subject to compliance with requirements, provide one of the following:
    - a. DERBIBOARD CA by Derbigum (use with Derbigum)
    - b. Firestone Building Products; RESISTA (use with Firestone)
    - c. Siplast, Inc., Paratherm CG (use with Siplast)
    - d. Soprema, Inc.; SOPRA-ISO+ Insulation (use with Soprema)
    - e. Specified roof membrane manufacturer supplied approved equal listed in their RoofNav tested assembly.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48) unless otherwise indicated.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

## 2.7 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Global 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. Bead-Applied Polyurethane Adhesive:
  - 1. Dual component polyurethane adhesive and primer (where applicable), used to attach roof cover board to roof insulation.
  - 2. Regular, summer or winter formula shall be bid and installed, such that manufacturer's installation criteria are met.
  - 3. Products: Subject to compliance with requirements, provide one of the following:
    - a. DERBIGUM Americas, Inc.; Derbibond LR.
    - b. Firestone Building Products; ISO Stick.
    - c. Royal Adhesives and Sealants, LLC; Millennium Surface Treatment and Millennium One-Step Foamable Adhesive.
    - d. Siplast; Parafast Insulation Adhesive.
    - e. Soprema, Inc.; DUOTACK.
- D. Insulation Cant Strips: ASTM C 728, perlite insulation board.
- E. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- F. Tapered Edge Strips: ASTM C 728, perlite insulation board.
- G. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.
- H. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/2 inch (12 mm) thick, factory primed.
  - 1. Products: Subject to compliance with requirements, provide the following:
    - a. Georgia-Pacific Gypsum Corp.; DensDeck Prime.
    - b. USG Securock gypsum-fiber board.
- I. Substrate Joint Tape: 6- or 8-inch- (150- or 200-mm-) wide, coated, glass fiber.

## 2.8 WALKWAYS

- A. Walkway granule color shall contrast the field membrane color; color as selected by the Owner from manufacturer's full range.
  - 1. Products: Subject to compliance with requirements, provide one of the following:

- a. DERBIGUM Americas, Inc.; Derbicolor GP FR and Perflash.
- b. Firestone Bldg. Products; Paratread and PA-1021 Plastic Cement.
- c. Siplast, Inc.; Paratread and PA-1021 Plastic Cement.
- d. Soprema, Inc.; Soprawalk.

## 2.9 OTHER MATERIALS

- A. All other materials not specifically described but required for a complete and proper installation of the work in this Section shall be as selected by the Contractor, approved by the manufacturer, and subject to approval by the Owner.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:
  - 1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
  - 2. Verify that cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
  - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 053100 "Steel Decking."
  - 4. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
  - 5. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
  - 6. Verify that concrete substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
    - a. Test for moisture by pouring 1 pint (0.5 L) of hot roofing asphalt on deck at start of each day's work and at start of each roof area or plane. Do not proceed with Work of this Section if test sample foams or can be easily and cleanly stripped after cooling.
- B. 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. Remove sharp projections.

- 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. Prime surface of vertical concrete surfaces with asphalt primer at a rate of 3/4 gal./100 sq. ft. (0.3 L/sq. m) and allow primer to dry.
- D. Install insulation strips on spacers to hold off of deck surface, in ribs of acoustical roof deck according to acoustical roof deck manufacturer's written instructions.

### 3.3 INSTALLATION, GENERAL

- A. Comply with roofing system manufacturer's written instructions.

### 3.4 INSULATION INSTALLATION

- A. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing system with vertical surfaces or angle changes greater than 45 degrees.
- B. Install tapered insulation under area of roofing to conform to slopes indicated.
- C. 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 (6 mm) with insulation.
  - 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- D. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
  - 1. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- F. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- G. Mechanically Fastened Insulation: Install base layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.
  - 1. Fasten insulation according to requirements in FM Global's "RoofNav" for specified Windstorm Resistance Classification.

2. Acoustical Roof Deck: Fasteners to be installed through raised ribs of deck only. No fasteners shall protrude below bottom of acoustical roof deck.
  3. Fasten first layer of insulation according to requirements in FM Global's "RoofNav" for specified Windstorm Resistance Classification.
  4. Set each subsequent layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
  5. Set each subsequent layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- H. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction. Loosely butt cover boards together. Tape joints if required by roofing system manufacturer. Adhere to roof insulation as follows:
1. Temperature of adhesive, substrate, and ambient conditions shall be within the manufacturer's recommended ranges during installation of insulation adhesive.
  2. Prepare substrate to receive polyurethane adhesive as recommended by the adhesive manufacturer.
    - a. Millennium One-Step or private-label versions of this product, apply Millennium Surface Treatment at 150 to 250 sq. ft. per gallon. Consult with manufacturer for rate clarification prior to bidding and installation.
  3. Seal around all penetrations and roof perimeters to ensure no adhesive drippage below the deck level.
  4. Install adhesive over the substrate in beads as follows:
    - a. Deribond LR: 1/2-inch wide wet beads.
    - b. Millennium One-Step or private-label versions of this Product: 1/2-inch wide wet beads.
    - c. OlyBond 500 or private-label versions of this Product: 3/4-inch to 1-inch wide wet beads.
    - d. Flexible FAST Adhesive: 1/2-inch wide wet beads.
    - e. Duotack: 1/2-inch to 3/4-inch wide wet beads.
  5. The minimum application rate shall be as listed below. If the adhesive manufacturer's required application rates are more restrictive than those listed herein, then the manufacturer's requirements shall be followed.
    - a. Field: Install beads at a spacing of 12 inches on center.
    - b. Perimeters: Install beads at a spacing of 6 inches on center.
    - c. Corners: Install beads at a spacing of 4 inches on center.
  6. Bead application patterns, and perimeter and corner areas shall be installed to achieve specified performance requirements.

### 3.5 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
- B. Install roofing system according to roofing system manufacturer's written instructions and applicable recommendations in ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing" and as follows:
  - 1. Deck Type: I (insulated).
  - 2. Adhering Method: L (cold-applied adhesive).
  - 3. Number of Modified Asphalt Sheets: One.
  - 4. Surfacing Type: M (mineral-granule-surfaced cap sheet).
- C. Start installation of roofing in presence of manufacturer's technical personnel.
- D. Coordinate installation of roofing system so insulation and other components of the roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
  - 1. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system.
  - 2. Remove and discard temporary seals before beginning work on adjoining roofing.

### 3.6 MODIFIED BITUMINOUS MEMBRANE INSTALLATION

- A. Install modified bituminous roofing sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing sheets over and terminate beyond cants, installing as follows:
  - 1. Adhere to substrate in cold-applied adhesive.
  - 2. Unroll roofing sheets and allow them to relax for minimum time period required by manufacturer.
  - 3. Temperature of adhesive, membrane and ambient conditions shall be within the manufacturer's recommended ranges during roof membrane application.
  - 4. Adhesive application methods shall conform with manufacturer's accepted practices. Notched squeegees, adhesive spreaders, and spray equipment are acceptable, subject to manufacturer's approval.
  - 5. Adhesive shall be applied at the minimum rate of 1-1/2 gallons per 100 sq. ft. Where porous substrates exist, the application rate for the base ply may need to be increased to ensure full adhesion. Application rates shall be determined by the Contractor and manufacturer for bidding and installation purposes.
- B. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
  - 1. Repair tears and voids in laps and lapped seams not completely sealed.

2. The following methods of lap adhesion shall be used for each listed component:
    - a. Field Membrane Base Ply: Hot air welding.
    - b. Field Membrane Top Ply: Hot air welding.
    - c. Flashing Base Ply: Hot air welding.
    - d. Flashing Top Ply: Hot air welding.
    - e. Flashing Strip-in Ply: Hot air welding.
  3. Where hot air welding of flashing laps is specified, all edges, including the flashing-to-field membrane lap, shall be prepared and hot air welded.
  4. If Derbigum material is used, all laps in sheets applied with Permastic and/or Perflash adhesives shall be hot air welded.
  5. Take care not to track, spill or apply adhesive over onto the finished exposed membrane. All exposed adhesive or excessive hot-weld bleed shall have #11 granules broadcast and pressed into the adhesive while still wet, so that the finished appearance is uniform and neat.
  6. Follow manufacturer's recommendations regarding length of time first layer of modified bitumen membrane may be exposed to the weather, prior to installation of the second layer. Maximum time allowed shall be 60 calendar days.
- C. Install roofing sheets so side and end laps shed water.

### 3.7 FLASHINGS

- A. Prime all masonry, concrete, wood, and metal substrates, and granular membrane surfaces with asphalt primer at the rate of 3/4 gallons per 100 square feet. Allow primer to dry prior to adhesive application. As an alternative to priming on granular surfaces, granules may be embedded into the sheet using a hot air gun and trowel.
- B. Bridge all junctures of vertical and horizontal surfaces with 45-degree cant strips, except where an existing wood cant is specified to remain or a prefabricated metal curb cant already exists. Wood cants, where shown, shall be properly fastened, fiber/perlite cants shall be fully adhered with manufacturer's recommended adhesive.
- C. Install two-ply modified bitumen base flashings in adhesive according to the manufacturer's current published application instructions, unless superseded by the requirements of this Section. Stagger laps between flashing plies.
- D. All base flashings shall be installed in 39-inch long pieces cut from the end of the roll. Flashing lap shall be bonded to the selvedge edge of the preceding flashing.
- E. Uniform coat(s) of adhesive shall be applied using a notched trowel. Flashings shall be thoroughly rubbed in. Loose or poorly bonded flashings will not be accepted. Fasten top edge of base flashing using the specified securement devices immediately after flashing installation. Masonry anchor spacing shall be 8 inches on center maximum. Nail spacing shall be 6 inches on center maximum.

- F. Unless top edges of base flashings are covered by single-ply curb/wall coverings, top edges shall be thoroughly sealed with one ply of reinforcing fabric fully embedded in asphalt roof cement immediately after layup.
- G. All inside and outside corners shall be three-coursed with asphalt roof cement and reinforcing fabric with #11 granules broadcast and pressed into the asphalt roof cement while wet.
- H. Flashing height shall be a minimum of 8 inches above finished roof height.
- I. Avoid applying bituminous materials over locations to receive caulking during subsequent sheet metal work. All such materials shall be thoroughly removed to the substrate prior to caulk application.

### 3.8 SET-ON METAL ACCESSORIES

- A. Install first layer of membrane under location to receive metal flange.
- B. Install metal flange embedded in asphalt roofing cement.
- C. Metal flanges that are required to be fastened shall be fastened with annular or ring shank nails 3 inches on center staggered.
- D. Prime top of metal flanges, then install one strip-in ply of first layer modified roof membrane in adhesive.
- E. Where flashing strip-in ply must be cut for installation around a roof penetration, the flashing shall be installed in two pieces. Pieces shall have 3-inch minimum side laps.
- F. Install top ply of field membrane over strip-in ply.
- G. Inspect edges of membrane plies and repair any loose or poorly bonded areas.
- H. Seal edge of membrane to sheet metal surface with a tooled bead of approved sealant.
- I. Pitch Pans:
  - 1. Install pitch pans only at locations where shown on the Drawings. Prior approval from the Owner's representative is required for pitch pan use at any other location.
  - 2. Pitch pans shall have a minimum depth of 4 inches and shall have a minimum clearance of 2 inches from penetration on all sides.
  - 3. Prime interior of pitch pan and penetration with polyurethane primer.
  - 4. Fill lower portion of pitch pan with grout and allow to dry. Fill top 2 inches with an acceptable pourable sealer.

### 3.9 ROOF DRAIN DETAILING

- A. Install first layer of modified membrane into drain under location to receive clamping ring.



- B. Install 27-inch by 27-inch lead set in asphalt roof cement under location to receive clamping ring. Prime lead flashing and allow primer to dry.
- C. Install strip-in poly of first layer membrane extending 6 inches past outer edge of lead flashing and under location to receive clamping ring.
- D. Install second layer modified membrane over strip-in ply and under location to receive clamping ring. Laps in the top ply shall be held a minimum of 12 inches away from edges of clamping rings.
- E. Set clamping ring and drain strainer.

### 3.10 WALKWAY INSTALLATION

- A. Walkway Strips: Install walkway cap-sheet strips over roofing membrane using same application method as used for roofing cap sheet.
- B. Verify walkway locations with the Owner's representative prior to installation.
- C. Chalk line walkway locations prior to installation to ensure a neat appearance.
- D. Neatly prime area to receive walkway and allow primer to dry. Confine priming to areas being covered by walkways.
- E. Space panels with 2-inch gaps for drainage, granule side up.
- F. Install Derbigum material in 10-foot maximum length sections, applied in mastic over the primed areas.
- G. Install Paratread material in 5-foot long sections, and allow sections to relax until they lay flat.
- H. For Paratread, apply plastic cement to the backside of precut sections, in squares approximately 5-feet by 5-feet. Space plastic cement applications approximately 11 inches on center along edges of panel and at 14 inches on center down the middle of the panel. Use a notched trowel to keep the cement 3/8-inch thick. Walk-in each panel to ensure complete contact with the membrane surface.

### 3.11 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does 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 roofing system that does not comply with requirements, repair substrates, and repair or reinstall 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.

### 3.12 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS \_\_\_\_\_ of \_\_\_\_\_, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
1. Owner: **<Insert name of Owner>**.
  2. Address: **<Insert address>**.
  3. Building Name/Type: **<Insert information>**.
  4. Address: **<Insert address>**.
  5. Area of Work: **<Insert information>**.
  6. Acceptance Date: \_\_\_\_\_.
  7. Warranty Period: **<Insert time>**.
  8. Expiration Date: \_\_\_\_\_.
- 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. peak gust wind speed exceeding **<Insert mph (m/s)>**;
    - 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.

E. IN WITNESS THEREOF, this instrument has been duly executed this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

1. Authorized Signature: \_\_\_\_\_.
2. Name: \_\_\_\_\_.
3. Title: \_\_\_\_\_.

END OF SECTION 075213



## SECTION 076200 - SHEET METAL FLASHING AND TRIM

### 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. This Section includes the following sheet metal flashing and trim:
  - 1. Formed low-slope roof sheet metal fabrications.
  - 2. Formed steep-slope roof sheet metal fabrications.
  - 3. Formed roof drainage sheet metal fabrications.
  - 4. Formed wall flashing and trim.
  - 5. Formed roof expansion joint cover sheet metal fabrications.
  - 6. Downspout adaptors to underground piping.
- B. Related Sections:
  - 1. Section 042000 "Unit Masonry" for installing through-wall flashing, reglets, and other sheet metal flashing and trim.
  - 2. Section 061000 "Rough Carpentry" for wood nailers, curbs, and blocking.
  - 3. Section 075216 "Modified Bituminous Membrane Roofing."

#### 1.3 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. Fabricate and install roof edge flashing and copings capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49.
  - 1. Wind Zone 1: For velocity pressures of 10 to 20 lbf/sq. ft. (0.48 to 0.96 kPa): 40-lbf/sq. ft. (1.92-kPa) perimeter uplift force, 60-lbf/sq. ft. (2.87-kPa) corner uplift force, and 20-lbf/sq. ft. (0.96-kPa) outward force.
- C. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of

joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- D. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

#### 1.4 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 counterflashings as applicable.
- C. Samples for Verification: 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.
- D. Qualification Data: For qualified fabricator.
- E. Warranty: Sample of special warranty.

## 1.5 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's "Architectural Sheet Metal Manual" unless more stringent requirements are specified or shown on Drawings.

## 1.6 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.

## 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal flashing and trim assemblies that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Structural failures, including rupturing, cracking, or puncturing.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 2. Warranty Period: Two years from date of Substantial Completion.
- B. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal flashing and trim that show 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. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
  - 1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
  - 2. Surface: Smooth, flat.
  - 3. Exposed Coil-Coated Finish:
    - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 4. Colors:
    - a. Berridge Mfg.: Matte Black.
  - 5. 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).

### 2.2 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226, Type II (No. 30), asphalt saturated organic felt, nonperforated.
- B. Flexible Sheet Vapor Retarder with Compressible Insulation: For roof expansion joint cover assemblies, provide the following:
  - 1. EPDM Flashing: Sheet flashing product made from ethylene-propylene-diene terpolymer, complying with ASTM D 4637, 0.040 inch (1.0 mm) thick.
    - a. Products: Subject to compliance with requirements, provide one of the following:
      - 1) Carlisle Coatings & Waterproofing; Pre-Kleened EPDM Thru-Wall Flashing.
      - 2) Firestone Building Products; FlashGuard.
      - 3) Heckmann Building Products, Inc.; No. 81 EPDM Thru-Wall Flashing.



## 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 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.
  - 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 Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- 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. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- G. Flexible Sheet Vapor Retarder with Compressible Insulation: For roof expansion joint cover assemblies, provide the following:
  - 1. EPDM Flashing: Sheet flashing product made from ethylene-propylene-diene-terpolymer, complying with ASTM D 4637, 0.040 inch (1.0 mm) thick.
    - a. Products: Subject to compliance with requirements, provide one of the following:
      - 1) Carlisle Coatings & Waterproofing; Pre-Kleened EPDM Thru-Wall Flashing.
      - 2) Firestone Building Products; FlashGuard.
      - 3) Heckmann Building Products, Inc.; No 81 EPDM Thru-Wall Flashing.

- b. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

## 2.4 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.
- 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 nonexpansion 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" and FMG Loss Prevention Data Sheet 1-49 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. Rivet joints where necessary for strength.
- G. Do not use graphite pencils to mark metal surfaces.

## 2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate

expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

1. Expansion Joints: Butt type with cover plate.
  2. Gutters with Girth 16 to 20 Inches (410 to 510 mm): Fabricate from the following materials:
    - a. Coil Coated Galvanized Steel: 0.028 inch (0.71 mm) thick.
- B. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
1. Fabricated Hanger Style: SMACNA figure designation 1-35G unless indicated otherwise.
  2. Fabricate from the following materials:
    - a. Coil Coated Galvanized Steel: 0.022 inch (0.56 mm) thick.
- C. Parapet Scuppers: Fabricate scuppers of dimensions required with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof. Fabricate from the following materials:
1. Coil Coated Galvanized Steel: 0.028 inch (0.71 mm) thick.
- D. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes, and exterior flange trim. Fabricate from the following materials:
1. Coil Coated Galvanized Steel: 0.028 inch (0.71 mm) thick.

## 2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners and seal watertight.
1. Joint Style: Butt, with 6-inch- (150-mm-) wide, concealed backer plates.
  2. Fabricate from the following materials:
    - a. Coil Coated Galvanized Steel: 0.040 inch (1.02 mm) thick.
- B. Roof and Roof to Wall Transition Expansion-Joint Cover: Fabricate from the following materials:
1. Coil Coated Galvanized Steel: 0.034 inch (0.86 mm) thick.
  2. Joint Style: Butt, with 6-inch- (150-mm-) wide, concealed backer plates.

- C. Counterflashing: Fabricate from the following materials:
  - 1. Coil Coated Galvanized Steel: 0.022 inch (0.56 mm) thick.
  - 2. Joint Style: Butt, with 6-inch- (150-mm-) wide, concealed backer plates.
- D. Flashing Receivers: Fabricate from the following materials:
  - 1. Coil Coated Galvanized Steel: 0.022 inch (0.56 mm) thick.
  - 2. Stainless steel at brick: 0.0156 inch (0.396 mm) thick.
  - 3. Joint Style: Butt, with 6-inch- (150-mm-) wide, concealed backer plates.
- E. Roof Expansion-Joint Cover: Fabricate from the following materials:
  - 1. Coil Coated Galvanized Steel: 0.0276 inch (0.7 mm) thick.
  - 2. Joint Style: Butt, with 6-inch- (150-mm-) wide, concealed backer plates
- F. Roof-to-Wall Expansion-Joint Cover: Fabricate from the following material:
  - 1. Coil Coated Galvanized Steel: 0.0336 inch (0.85 mm) thick.

## 2.7 DOWNSPOUT ADAPTORS TO UNDERGROUND PIPING

- A. Provide downspout boots made stainless steel with inlets of size and shape to watch downspouts.
  - 1. Outlet: Horizontal, to discharge into pipe.
  - 2. Height: 24 inches.
- B. Basis of Design Product: Subject to compliance with requirements, provide Piedmont Pipe, USA.
- C. Finish: Factory-powder-coated to match downspout color.

## 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. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 UNDERLAYMENT INSTALLATION

- A. 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).

### 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 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. Anchor continuous cleats with fasteners at 6 inches on center maximum.
  4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
  5. Torch cutting of sheet metal flashing and trim is not permitted.
  6. 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 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. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

### 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.
- B. Hanging Gutters: Join sections with lapped joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36 inches (900 mm) apart. Provide end closures and seal watertight with sealant.
  - 1. Fasten gutter spacers to front and back of gutter.
  - 2. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches (600 mm) apart.
- C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints.
  - 1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
- D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches (100 mm) in direction of water flow.
  - 1. Install flexible sheet vapor retarder with compressible insulation under roof expansion joint assemblies. Install retarder with adhesives at laps and substrates to provide a weathertight assembly.
  - 2. Tie-in retarders to retarders installed behind wall expansion joint covers with adhesive for a continuous vapor barrier.
- E. Roof Edge Scuppers: Install scuppers where indicated through roof edge. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

### 3.5 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, 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.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at 6-inch (150-mm) centers.
- C. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 6-inch (150-mm) centers.
  2. Anchor interior leg of coping with screw fasteners and washers at 18-inch (450-mm) centers.
- 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 by means of anchor and washer at 12-inch (300-mm) centers.

### 3.6 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.

### 3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean off excess sealants.
- C. 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.
- D. 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.

END OF SECTION 076200





## SECTION 077200 - ROOF ACCESSORIES

### 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. Roof hatches.

- B. Related Sections:

- 1. Section 055000 "Metal Fabrications" for metal vertical ladders, ships' ladders, and stairs for access to roof hatches.
  - 2. Section 055213 "Pipe and Tube Railings" for safety railing systems not attached to roof-hatch curbs.
  - 3. Section 076200 "Sheet Metal Flashing and Trim" for shop- and field-formed metal flashing, roof-drainage systems, roof expansion-joint covers, and miscellaneous sheet metal trim and accessories.
  - 4. Section 077100 "Roof Specialties" for manufactured fasciae, copings, gravel stops, gutters and downspouts, and counterflashing.
  - 5. Section 233423 "HVAC Power Ventilators" for power roof-mounted ventilators.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For roof accessories to include in operation and maintenance manuals.

## ROOF ACCESSORIES

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## 1.6 COORDINATION

- A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
- B. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.

## PART 2 - PRODUCTS

### 2.1 METAL MATERIALS

- A. Aluminum Sheet: ASTM B 209 (ASTM B 209M), manufacturer's standard alloy for finish required, with temper to suit forming operations and performance required.
  - 1. Mill Finish: As manufactured.
- B. Aluminum Extrusions and Tubes: ASTM B 221 (ASTM B 221M), manufacturer's standard alloy and temper for type of use, finished to match assembly where used, otherwise mill finished.

### 2.2 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Polyisocyanurate Board Insulation: ASTM C 1289, thickness as indicated.
- C. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, acceptable to authorities having jurisdiction, containing no arsenic or chromium, and complying with AWPAC2; not less than 1-1/2 inches (38 mm) thick.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- E. Fasteners: Roof accessory manufacturer's recommended fasteners suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
  - 1. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
- F. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.

- G. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant as recommended by roof accessory manufacturer for installation indicated; low modulus; of type, grade, class, and use classifications required to seal joints and remain watertight.
- H. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for expansion joints with limited movement.
- I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

## 2.3 ROOF HATCH

- A. Roof Hatches: Metal roof-hatch units with lids and insulated single-walled curbs, welded or mechanically fastened and sealed corner joints, continuous lid-to-curb counterflashing and weathertight perimeter gasketing, integral metal cant, and integrally formed deck-mounting flange at perimeter bottom.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. AES Industries, Inc.
    - b. Babcock-Davis.
    - c. Bilco Company (The).
    - d. Bristolite Skylights.
    - e. Custom Solution Roof and Metal Products.
    - f. Dur-Red Products.
    - g. Hi Pro International, Inc.
    - h. J. L. Industries, Inc.
    - i. Metallic Products Corp.
    - j. Milcor Inc.; Commercial Products Group of Hart & Cooley, Inc.
    - k. Naturalite Skylight Systems; Vistawall Group (The).
    - l. Nystrom.
    - m. O'Keeffe's Inc.
    - n. Pate Company (The).
    - o. Precision Ladders, LLC.
- B. Type and Size: Single-leaf lid, 30 by 54 inches (750 by 1370 mm).
- C. Loads: Minimum 40-lbf/sq. ft. (1.9-kPa) external live load and 20-lbf/sq. ft. (0.95-kPa) internal uplift load.
- D. Hatch Material: Aluminum sheet, 0.090 inch (2.28 mm) thick.
  - 1. Finish: Mill.
- E. Construction:
  - 1. Insulation: Polyisocyanurate board.

2. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
  3. Curb Liner: Manufacturer's standard, of same material and finish as metal curb.
  4. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
  5. Fabricate curbs to minimum height of 12 inches (300 mm) unless otherwise indicated.
- F. Hardware: Galvanized-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
- G. Safety Railing System: Roof-hatch manufacturer's standard system including rails, clamps, fasteners, safety barrier at railing opening, and accessories required for a complete installation; attached to roof hatch and complying with 29 CFR 1910.23 requirements and authorities having jurisdiction.
1. Height: 42 inches (1060 mm) above finished roof deck.
  2. Posts and Rails: Galvanized-steel pipe, 1-1/4 inches (31 mm) in diameter or galvanized-steel tube, 1-5/8 inches (41 mm) in diameter.
  3. Flat Bar: Galvanized steel, 2 inches (50 mm) high by 3/8 inch (9 mm) thick.
  4. Maximum Opening Size: System constructed to prevent passage of a sphere 21 inches (533 mm) in diameter.
  5. Self-Latching Gate: Fabricated of same materials and rail spacing as safety railing system. Provide manufacturer's standard hinges and self-latching mechanism.
  6. Post and Rail Tops and Ends: Weather resistant, closed or plugged with prefabricated end fittings.
  7. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members.
  8. Fabricate joints exposed to weather to be watertight.
  9. Fasteners: Manufacturer's standard, finished to match railing system.
  10. Finish: Manufacturer's standard.

## 2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- 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.

## 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.

## ROOF ACCESSORIES

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- B. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
- C. Verify dimensions of roof openings for roof accessories.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions.
  - 1. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
  - 2. Anchor roof accessories securely in place so they are capable of resisting indicated loads.
  - 3. Use fasteners, separators, sealants, and other miscellaneous items as required to complete installation of roof accessories and fit them to substrates.
  - 4. Install roof accessories to resist exposure to weather without failing, rattling, leaking, or loosening of fasteners and seals.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
  - 1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
  - 2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof accessories for waterproof performance.
- C. Roof-Hatch Installation:
  - 1. Install roof hatch so top surface of hatch curb is level.
  - 2. Verify that roof hatch operates properly. Clean, lubricate, and adjust operating mechanism and hardware.
  - 3. Attach safety railing system to roof-hatch curb.
- D. Seal joints with elastomeric or butyl sealant as required by roof accessory manufacturer.

### 3.3 REPAIR AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing according to ASTM A 780.
- B. Clean exposed surfaces according to manufacturer's written instructions.
- C. Clean off excess sealants.
- D. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

LEE'S SUMMIT MIDDLE SCHOOL #4  
PACKAGE 3 – BUILDING & SITE  
LEE'S SUMMIT, MISSOURI

13-20102-00  
8 OCTOBER 2020  
PERMIT SET

END OF SECTION 077200

## SECTION 078413 - PENETRATION FIRESTOPPING

### 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. This Section includes through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.
- B. Related Sections include the following:
  - 1. Division 21 Sections specifying fire-suppression piping penetrations.
  - 2. Division 22 and 23 Sections specifying duct and piping penetrations.
  - 3. Division 26, 27, and 28 Sections specifying cable and conduit penetrations.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.
  - 1. Fire-resistance-rated walls including fire walls, fire partitions and fire barriers.
- B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479:
  - 1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
  - 2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:
    - a. Penetrations located outside fire-resistance-rated shaft enclosures.

- C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.
  - 1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
  - 2. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.
- D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.
  - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
  - 2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.
- C. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:
  - 1. Types of penetrating items.
  - 2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
  - 3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.

#### 1.5 INFORMATION SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.



- C. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors."
- B. Installer Qualifications: A firm experienced in installing through-penetration firestop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance. Qualifications include having the necessary experience, staff, and training to install manufacturer's products per specified requirements. Manufacturer's willingness to sell its through-penetration firestop system products to Contractor or to Installer engaged by Contractor does not in itself confer qualification on buyer.
- C. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- D. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.
- E. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
  - 1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
  - 2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:
    - a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
    - b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:
      - 1) UL in its "Fire Resistance Directory."
      - 2) OPL in its "Directory of Listed Building Products, Materials, & Assemblies."
      - 3) ITS in its "Directory of Listed Products."

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

## 1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

## 1.9 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.
- C. Notify Owner's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.
- D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by Owner's inspecting agency and building inspector, if required by authorities having jurisdiction.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Through-Penetration Firestop Systems:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following manufacturers:
    - a. A/D Fire Protection Systems Inc.

## PENETRATION FIRESTOPPING

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- b. Grace, W. R. & Co. - Conn.
- c. Hilti, Inc.
- d. Johns Manville.
- e. Nelson Firestop Products.
- f. NUCO Inc.
- g. RectorSeal Corporation (The).
- h. Specified Technologies Inc.
- i. 3M; Fire Protection Products Division.
- j. Tremco; Sealant/Weatherproofing Division.
- k. USG Corporation.

## 2.2 FIRESTOPPING, GENERAL

- A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.
- B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:
  - 1. Permanent forming/damming/backing materials, including the following:
    - a. Slag-/rock-wool-fiber insulation.
    - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    - c. Fire-rated form board.
    - d. Fillers for sealants.
  - 2. Temporary forming materials.
  - 3. Substrate primers.
  - 4. Collars.
  - 5. Steel sleeves.

## 2.3 FILL MATERIALS

- A. General: Provide through-penetration firestop systems containing the types of fill materials by referencing the types of materials described in this Article. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.
- B. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

- C. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.
- D. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- E. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.
- F. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- G. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- H. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- I. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.
- J. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- K. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
  - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
  - 2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
  - 3. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

## 2.4 MIXING

- A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:
  - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
  - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

### 3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

- A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

- C. Install fill materials for firestop systems by proven techniques to produce the following results:
1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
  2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 IDENTIFICATION

- A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:
1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
  2. Contractor's name, address, and phone number.
  3. Through-penetration firestop system designation of applicable testing and inspecting agency.
  4. Date of installation.
  5. Through-penetration firestop system manufacturer's name.
  6. Installer's name.

### 3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified, independent inspecting agency to inspect through-penetration firestops. Independent inspecting agency shall comply with ASTM E 2174 requirements including those related to qualifications, conducting inspections, and preparing test reports.
- B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.
- C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

### 3.6 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

- B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION 078413





## SECTION 078446 - FIRE-RESISTIVE JOINT SYSTEMS

### 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. Joints in or between fire-resistance-rated constructions.
  - 2. Joints at exterior floor intersections.
- B. Related Sections:
  - 1. Section 078413 "Penetration Firestopping" for penetrations in fire-resistance-rated walls, horizontal assemblies, and smoke barriers.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For qualified Installer.
- C. Installer Certificates: From Installer indicating fire-resistive joint systems have been installed in compliance with requirements and manufacturer's written recommendations.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for fire-resistive joint systems.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with UL's "Qualified Firestop Contractor Program Requirements."
- B. Fire-Test-Response Characteristics: Fire-resistive joint systems shall comply with the following requirements:
  - 1. Fire-resistive joint system tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.

2. Fire-resistive joint systems are identical to those tested per testing standard referenced in "Fire-Resistive Joint Systems" Article. Provide rated systems complying with the following requirements:
  - a. Fire-resistive joint system products bear classification marking of qualified testing agency.
  - b. Fire-resistive joint systems correspond to those indicated by reference to designations listed by the following:
    - 1) UL in its "Fire Resistance Directory."
    - 2) Intertek ETL SEMKO in its "Directory of Listed Building Products."

C. Preinstallation Conference: Conduct conference at Project site.

## 1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Install and cure fire-resistive joint systems per manufacturer's written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.

## 1.6 COORDINATION

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.
- C. Notify Owner's testing agency at least seven days in advance of fire-resistive joint system installations; confirm dates and times on day preceding each series of installations.

## PART 2 - PRODUCTS

### 2.1 FIRE-RESISTIVE JOINT SYSTEMS

- A. Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints in or between Fire-Resistance-Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079:

## FIRE-RESISTIVE JOINT SYSTEMS

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1. Joints include those installed in or between fire-resistance-rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies.
  2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.
  3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. A/D Fire Protection Systems Inc.
    - b. CEMCO.
    - c. Fire Trak Corp.
    - d. Grace Construction Products.
    - e. Hilti, Inc.
    - f. Johns Manville.
    - g. Nelson Firestop Products.
    - h. NUCO Inc.
    - i. Passive Fire Protection Partners.
    - j. RectorSeal Corporation.
    - k. Specified Technologies Inc.
    - l. 3M Fire Protection Products.
    - m. Tremco, Inc.; Tremco Fire Protection Systems Group.
    - n. USG Corporation.
- C. Joints at Wall/Floor Intersections: Provide fire-resistive joint systems with rating determined by ASTM E 119 based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa) or ASTM E 2307.
1. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the floor assembly.
  2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. A/D Fire Protection Systems Inc.
    - b. Grace Construction Products.
    - c. Hilti, Inc.
    - d. Johns Manville.
    - e. Nelson Firestop Products.
    - f. NUCO Inc.
    - g. Passive Fire Protection Partners.
    - h. RectorSeal Corporation.
    - i. Specified Technologies Inc.
    - j. 3M Fire Protection Products.
    - k. Thermafiber, Inc.
    - l. Tremco, Inc.; Tremco Fire Protection Systems Group.
    - m. USG Corporation.
- D. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

- E. VOC Content: Fire-resistive joint system sealants shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
  - 1. Architectural Sealants: 250 g/L.
  - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
  - 3. Sealant Primers for Porous Substrates: 775 g/L.
- F. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials that are needed to install fill materials and to maintain ratings required. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing agency for systems indicated.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
  - 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
  - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing fire-resistive joint system's seal with substrates.

### 3.3 INSTALLATION

- A. General: Install fire-resistive joint systems to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
  - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
- C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
  - 1. Fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
  - 2. Apply fill materials so they contact and adhere to substrates formed by joints.
  - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 IDENTIFICATION

- A. Identify fire-resistive joint systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of joint edge so labels will be visible to anyone seeking to remove or penetrate joint system. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
  - 1. The words "Warning - Fire-Resistive Joint System - Do Not Disturb. Notify Building Management of Any Damage."
  - 2. Contractor's name, address, and phone number.
  - 3. Designation of applicable testing agency.
  - 4. Date of installation.
  - 5. Manufacturer's name.
  - 6. Installer's name.

### 3.5 FIELD QUALITY CONTROL

- A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Where deficiencies are found or fire-resistive joint systems are damaged or removed due to testing, repair or replace fire-resistive joint systems so they comply with requirements.

- C. Proceed with enclosing fire-resistive joint systems with other construction only after inspection reports are issued and installations comply with requirements.

### 3.6 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which joints occur.
- B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

### 3.7 FIRE-RESISTIVE JOINT SYSTEM SCHEDULE

- A. Where UL-classified systems are indicated, they refer to system numbers in UL's "Fire Resistance Directory" under product Category XHBN or Category XHDG.
- B. Wall-to-Wall, Fire-Resistive Joint Systems:
  - 1. UL-Classified Systems: WW-D- 0000-0999.
  - 2. Assembly Rating: 1 hour or 2 hours as indicated.
  - 3. Nominal Joint Width: As indicated.
  - 4. Movement Capabilities: Class I – 12.5 percent compression or extension.
  - 5. L-Rating at Ambient: Less than 1 cfm/ft. (cu. m/s x m).
  - 6. L-Rating at 400 deg F (204 deg C): Less than 1 cfm/ft. (cu. m/s x m).
- C. Head-of-Wall, Fire-Resistive Joint Systems:
  - 1. UL-Classified Systems: HW-D- 0000-0999.
  - 2. Assembly Rating: 1 hour or 2 hours as indicated.
  - 3. Nominal Joint Width: As indicated.
  - 4. Movement Capabilities: Class I – 12.5 percent compression or extension.
  - 5. L-Rating at Ambient: Less than 1 cfm/ft. (cu. m/s x m).
  - 6. L-Rating at 400 deg F (204 deg C): Less than 1 cfm/ft. (cu. m/s x m).
- D. Perimeter Fire-Resistive Joint Systems:
  - 1. UL-Classified Perimeter Fire-Containment Systems: As indicated.
  - 2. Integrity Rating: 1 hour.
  - 3. Insulation Rating: 1 hour.
  - 4. Linear Opening Width: As indicated.
  - 5. Movement Capabilities: Class I – 12.5 percent compression or extension.
  - 6. L-Rating at Ambient Temperature: Less than 1 cfm/ft. (cu. m/s x m).
  - 7. L-Rating at 400 deg F (204 deg C): Less than 1 cfm/ft. (cu. m/s x m).

LEE'S SUMMIT MIDDLE SCHOOL #4  
PACKAGE 3 – BUILDING & SITE  
LEE'S SUMMIT, MISSOURI

13-20102-00  
8 OCTOBER 2020  
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END OF SECTION 078446





## SECTION 079200 - JOINT SEALANTS

### 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. Silicone joint sealants.
  - 2. Urethane joint sealants.
  - 3. Mildew-resistant joint sealants.
  - 4. Butyl joint sealants.
  - 5. Latex joint sealants.

- B. Related Requirements:

- 1. Section 079219 "Acoustical Joint Sealants" for sealing joints in sound-rated construction.
  - 2. Section 321373 "Concrete Paving Joint Sealants" for sealing joints in paved roads, parking lots, walkways, and curbing.

#### 1.3 PREINSTALLATION MEETINGS

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

- 1. Attendees shall include installer and manufacturer's technical representative.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.

- B. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

- C. Joint-Sealant Schedule: Include the following information:

- 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.

4. Joint-sealant color.

## 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by a qualified testing agency.
- C. Sample Warranties: For special warranties.

## 1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency.
  1. Testing Agency Qualifications: Qualified according to ASTM C1021 to conduct the testing indicated.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

## PART 2 - PRODUCTS

### 2.1 JOINT SEALANTS, 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 demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

### 2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
  1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Dow Corning Corporation; Dow Corning® 791 Silicone Weatherproofing Sealant.

## JOINT SEALANTS

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- b. GE Construction Sealants; Momentive Performance Materials Inc.; SCS5900 SilPruf.
- c. May National Associates, Inc.; a subsidiary of Sika Corporation; Bondaflex Sil 265 LTS.
- d. Pecora Corporation; PCS.
- e. Sika Corporation; Joint Sealants; Sikasil WS-295.
- f. Tremco; Spectrum 3.

## 2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. BASF Corporation; MasterSeal TX 1 (Pre-2014: Sonolastic TX1).
- b. Bostik, Inc; Chem-Calk GPS1.
- c. ER Systems; an ITW Company; Pacific Polymers Elasto-Thane 230 MP.
- d. Pecora Corporation; Dynatrol I-XL.
- e. Polymeric Systems, Inc; Flexiprene 1000.
- f. Schnee-Morehead, Inc., an ITW company; Permthane SM7108.
- g. Sherwin-Williams Company (The); Stampede-1.
- h. Sika Corporation; Joint Sealants; Sikaflex Textured Sealant.
- i. Tremco Incorporated; Dymonic.

- B. Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T and NT.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. BASF Corporation; MasterSeal SL 1 (Pre-2014: Sonolastic SL1).
- b. Pecora Corporation; NR-201.
- c. Polymeric Systems, Inc; Flexiprene 952.
- d. Schnee-Morehead, Inc., an ITW company; Permthane SM7101.
- e. Sherwin-Williams Company (The); Stampede 1SL.

## 2.4 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Dow Corning Corporation; DOW CORNING® 786 SILICONE SEALANT -.
  - b. GE Construction Sealants; Momentive Performance Materials Inc.; SCS1700 Sanitary.
  - c. May National Associates, Inc.; a subsidiary of Sika Corporation; Bondaflex Sil 100 WF.
  - d. Soudal USA; RTV GP.
  - e. Tremco Incorporated; Tremsil 200.

## 2.5 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311.

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. Bostik, Inc; Chem-Calk 300.
  - b. Pecora Corporation; BC-158.

## 2.6 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, provide one of the following:
  - a. BASF Construction Chemicals – Building Systems; Sonolac.
  - b. May National Associates, Inc.; a subsidiary of Sika Corporation; Bondaflex 600.
  - c. Pecora Corporation; AC-20.
  - d. Sherwin-Williams Company (The); 850A Siliconized Acrylic Latex Caulk.
  - e. Tremco Incorporated; Tremflex 834.

## 2.7 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
  1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. BASF Corporation.
    - b. Construction Foam Products; a division of Nomaco, Inc.
- B. Cylindrical Sealant Backings: ASTM C1330, Type B (bicellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

- C. Bond-Breaker Tape: Polyethylene tape 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. Provide self-adhesive tape where applicable.

## 2.8 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.
- 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 to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## 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 performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Start of work indicates the installer's acceptance of substrate conditions.

### 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 all 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), oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, 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 after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
    - a. Concrete.
    - b. Masonry.

## JOINT SEALANTS

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- c. Unglazed surfaces of ceramic tile.
- 3. Remove laitance and form-release agents from concrete.
- 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
  - a. Metal.
  - b. Glass.
  - c. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime all exterior joint substrates. 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 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 C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind 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.
  - 1. Do not leave gaps between ends of sealant backings.
  - 2. Do not stretch, twist, puncture, or tear sealant backings.
  - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  - 1. Place sealants so they directly contact and fully wet joint substrates.
  - 2. Completely fill recesses in each joint configuration.
  - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
  2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
  3. Provide concave joint profile per Figure 8A in ASTM C1193 unless otherwise indicated.

### 3.4 CLEANING

- A. Clean off excess sealant 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.

### 3.5 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, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

### 3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
    - a. Control and expansion joints in CMU and brick masonry.
    - b. Joints in precast architectural and structural concrete panels.
    - c. Joints at perimeter of metal panels adjacent to dissimilar materials.
    - d. Joints between different materials listed above.
    - e. Perimeter joints between materials listed above and frames of doors windows and louvers.
    - f. Control and expansion joints in ceilings and other overhead surfaces.
    - g. Other joints as indicated on Drawings.
  2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:

- a. Control and expansion joints in exposed concrete floor slabs.
    - b. Other joints as indicated on Drawings.
  2. Joint Sealant: Urethane, S, P, 25, T, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
    - a. Control and expansion joints on exposed interior surfaces of exterior walls.
    - b. Tile control and expansion joints.
    - c. Vertical joints on exposed surfaces of walls and partitions.
    - d. Other joints as indicated on Drawings.
  2. Joint Sealant: Urethane, S, NS, 25, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
1. Joint Locations:
    - a. Control joints on exposed interior surfaces of exterior walls.
    - b. Perimeter joints between interior wall surfaces and frames of windows.
    - c. Other joints as indicated on Drawings.
  2. Joint Sealant: Acrylic latex.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
    - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - b. Tile control and expansion joints where indicated.
    - c. Other joints as indicated on Drawings.
  2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- F. Joint-Sealant Application: Concealed mastics.
1. Joint Locations:
    - a. Aluminum thresholds.
    - b. Sill plates.
    - c. Other joints as indicated on Drawings.



2. Joint Sealant: Butyl-rubber based.

END OF SECTION 079200



## SECTION 079219 - ACOUSTICAL JOINT SEALANTS

### 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 acoustical joint sealants.
- B. Related Requirements:
  - 1. Section 079200 "Joint Sealants" for elastomeric, latex, and butyl-rubber-based joint sealants for non-acoustical applications.

#### 1.3 ACTION SUBMITTALS

- A. Product Data: For each acoustical joint sealant.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of acoustical joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Acoustical-Joint-Sealant Schedule: Include the following information:
  - 1. Joint-sealant application, joint location, and designation.
  - 2. Joint-sealant manufacturer and product name.
  - 3. Joint-sealant formulation.
  - 4. Joint-sealant color.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each kind of acoustical joint sealant, for tests performed by a qualified testing agency.
- B. Sample Warranties: For special warranties.

## 1.5 WARRANTY

- A. Special Manufacturer's Warranty: Manufacturer agrees to furnish acoustical joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Provide acoustical joint-sealant products that effectively reduce airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies according to ASTM E90.

### 2.2 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant for Exposed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C834.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Accumetric LLC; BOSS 826 Acoustical Sound Sealant.
    - b. GE Construction Sealants; Momentive Performance Materials Inc.; RCS20 Acoustical.
    - c. Grabber Construction Products; Acoustical Sealant GSC.
    - d. OSI Sealants; Henkel Corporation; OSI Pro-Series SC-175 Acoustical Sound Sealant.
    - e. Pecora Corporation; AC-20 FTR.
    - f. Serious Energy Inc.; Quiet Seal Pro.
    - g. Tremco Incorporated; Tremco Acoustical Sealant.
    - h. USG Corporation; SHEETROCK Acoustical Sealant.
  - 2. Colors of Exposed Acoustical Joint Sealants: As selected by Architect from manufacturer's full range of colors.
- B. Acoustical Sealant for Concealed Joints: Manufacturer's standard nonsag, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber acoustical sealant.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Pecora Corporation; BA-98.
    - b. Serious Energy Inc.; Quiet Seal 350.

## 2.3 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by acoustical-joint-sealant manufacturer where required for adhesion of sealant to joint substrates.
- 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 to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive acoustical joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where recommended by acoustical-joint-sealant manufacturer. 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 smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF ACOUSTICAL JOINT SEALANTS

- A. Comply with acoustical joint-sealant manufacturer's written installation instructions unless more stringent requirements apply.
- B. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint

sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C919, ASTM C1193, and manufacturer's written recommendations for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.

### 3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of acoustical joint sealants and of products in which joints occur.

### 3.5 PROTECTION

- A. Protect acoustical 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, remove, and repair damaged or deteriorated acoustical joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 079219

## SECTION 079500 - EXPANSION CONTROL

### 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. This Section includes the following:
  - 1. Architectural joint systems for building interiors.
  - 2. Architectural joint systems for building exteriors.
- B. Related Sections include the following:
  - 1. Section 033000 "Cast-in-Place Concrete" for cast-in architectural-joint-system frames furnished, but not installed, in this Section.
  - 2. Section 042000 "Unit Masonry" for masonry wall joint systems.
  - 3. Section 076200 "Sheet Metal Flashing and Trim" for sheet metal roof joint systems.
  - 4. Section 079200 "Joint Sealants" for liquid-applied joint sealants.
  - 5. Section 092900 "Gypsum Board" for gypsum board wall joint systems.
  - 6. Section 075213 "Modified Bituminous Membrane Roofing" for roof expansion control.

#### 1.3 DEFINITIONS

- A. Maximum Joint Width: Widest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.
- B. Minimum Joint Width: Narrowest linear gap a joint system tolerates and in which it performs its designed function without damaging its functional capabilities.
- C. Movement Capability: Value obtained from the difference between widest and narrowest widths of a joint opening typically expressed in numerical values (mm or inches) or a percentage (plus or minus) of nominal value of joint width.
- D. Nominal Joint Width: The width of the linear opening specified in practice and in which the joint system is installed.

#### 1.4 ACTION SUBMITTALS

- A. Shop Drawings: Provide the following for each joint system specified:

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1. Placement Drawings: Include line diagrams showing plans, elevations, sections, details, splices, blackout requirement, entire route of each joint system, and attachments to other work. Where joint systems change planes, provide isometric or clearly detailed drawing depicting how components interconnect.
2. Architectural Joint System Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
  - a. Manufacturer and model number for each joint system.
  - b. Joint system location cross-referenced to Drawings.
  - c. Nominal joint width.
  - d. Movement capability.
  - e. Classification as thermal or seismic.
  - f. Materials, colors, and finishes.
  - g. Product options.

B. Samples for Initial Selection: For each type of joint system indicated.

1. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric seal material.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain architectural joint systems through one source from a single manufacturer.
- C. Product Options: Specifications indicate size, profiles, and dimensional requirements of architectural joint systems and are based on the specific systems indicated.
  1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- D. Accessibility Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines (ADAAG)" and ICC A117.1.

## 1.6 COORDINATION

- A. Coordinate installation of exterior wall and soffit joint systems with roof expansion assemblies to ensure that wall transitions are watertight. Roof expansion assemblies are specified in Division 07.



## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063-T5 for extrusions; ASTM B 209 (ASTM B 209M), Alloy 6061-T6 for sheet and plate.
  - 1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.
- B. Elastomeric Seals: Preformed elastomeric membranes or extrusions to be installed in metal frames.
- C. Compression Seals: ASTM E 1612; preformed rectangular elastomeric extrusions having internal baffle system and designed to function under compression.
- D. Moisture Barrier: Flexible elastomeric material, EPDM, minimum 45 mils thick.
- E. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

### 2.2 ARCHITECTURAL JOINT SYSTEMS, GENERAL

- A. General: Provide architectural joint systems of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
  - 1. Furnish units in longest practicable lengths to minimize field splicing. Install with hairline mitered corners where joint changes direction or abuts other materials.
  - 2. Include factory-fabricated closure materials and transition pieces, tee-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous joint systems.

### 2.3 ARCHITECTURAL JOINT SYSTEMS FOR BUILDING INTERIORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the products specified in individual subparagraphs below as basis-of-design products or a comparable product by one of the following:
  - 1. Architectural Art Mfg., Inc.
  - 2. Balco, Inc.
  - 3. Construction Specialties, Inc.
  - 4. JointMaster/InPro Corporation.
  - 5. MM Systems Corporation.
  - 6. Watson Bowman Acme Corp.

B. Floor-to-Floor Joint Systems (EJ-1):

1. Basis-of-Design Product: Construction Specialties, Inc., Model SJP-400 with MFX4F at 4-inch joints.
2. Type: Flush floor cover.
  - a. Exposed Metal: Aluminum.
    - 1) Finish: Manufacturer's standard finish.
  - b. Gasket Material: Santoprene.
    - 1) Color: Custom color selected by Architect.
3. Attachment Method: Mechanical anchors.
4. Load Capacity: Standard duty.

C. Floor-to-Wall Joint Systems (EJ-2):

1. Basis-of-Design Products:
  - a. For Gypsum Board Applications: Construction Specialties, Inc., Model SJPW-400 with MFX4F.
2. Type: Flush floor cover.
  - a. Exposed Metal: Aluminum.
    - 1) Finish: Manufacturer's standard finish.
  - b. Gasket Material: Santoprene.
    - 1) Color: Custom color selected by Architect.
3. Attachment Method: Mechanical anchors.

D. Wall-to-Wall and Ceiling-to-Ceiling Joint Systems (EJ-3):

1. Basis-of-Design Products:
  - a. For Gypsum Board Applications: Construction Specialties, Inc., Model SFW-400 with FB for 4-inch joints.
2. Type: Flush wall cover.
  - a. Exposed Metal: Aluminum.
    - 1) Finish: Manufacturer's standard finish.
  - b. Gasket Material: Santoprene.

- 1) Color: Custom color selected by Architect.

E. Wall-to-Ceiling Joint Systems (EJ-4):

1. Basis-of-Design Products:

- a. For Gypsum Board Applications: Construction Specialties, Inc., Model SCW-400 with FB for 4-inch joints.

2. Type: Flush ceiling cover.

- a. Exposed Metal: Aluminum.

- 1) Finish: Manufacturer's standard finish.

- b. Gasket Material: Santoprene.

- 1) Color: White.

## 2.4 ARCHITECTURAL JOINT SYSTEMS FOR BUILDING EXTERIORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide the products specified in individual subparagraphs below as basis-of-design products or a comparable product by one of the following:

1. Architectural Art Mfg., Inc.
2. Balco, Inc.
3. Construction Specialties, Inc.
4. JointMaster/InPro Corporation.
5. MM Systems Corporation.
6. Watson Bowman Acme Corp.

B. Architectural Joint Systems for Exterior Walls and Soffits (EJ-5A):

1. Basis-of-Design Product: Construction Specialties, Inc., Model ASM-400X Series with FB for 4-inch joints

2. Type: Flush wall cover.

- a. Exposed Metal: Aluminum.

- 1) Finish: Manufacturer's standard finish.

C. Architectural Joint Systems for Exterior Roofs (EJ-5B):

1. Basis-of-Design Product: Construction Specialties, Inc., Model SF-400 with FB for 4-inch joints.

2. Type: Horizontal cover-plate.

- a. Exposed Metal: Aluminum.
- b. Gasket Material: Santoprene.
  - 1) Color: Gray.
- c. Secondary Seal: Manufacturer's standard polyethylene vapor barrier designed to prevent water and moisture infiltration.

D. Architectural Joint Systems for Exterior Roofs (EJ-6):

- 1. Refer to Section 076200 "Sheet Metal Flashing and Trim" and Section 075213 "Modified Bituminous Membrane Roofing". Expansion Control to be provided by Roofing Contractor.

2.5 FINISHES

- 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: Noticeable variations in same piece are not acceptable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and blockouts where architectural joint systems will be installed for installation tolerances and other conditions affecting performance of work.
  - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to architectural joint system manufacturer's written instructions.
- B. Repair concrete slabs and blockouts using manufacturer's recommended repair grout of compressive strength adequate for anticipated structural loadings.
- C. Coordinate and furnish anchorages, setting drawings, and instructions for installing joint systems. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of joint systems.
- D. Cast-In Frames: Coordinate and furnish frames to be cast into concrete.

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### 3.3 INSTALLATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing architectural joint assemblies and materials unless more stringent requirements are indicated.
- B. Metal Frames: Perform cutting, drilling, and fitting required to install joint systems.
  - 1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
  - 2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation. Notify Architect where discrepancies occur that will affect proper joint installation and performance.
  - 3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
  - 4. Locate in continuous contact with adjacent surfaces.
  - 5. Standard-Duty Systems: Shim to level where required. Support underside of frames continuously to prevent vertical deflection when in service.
  - 6. Heavy-Duty Systems: Repair or grout blockout as required for continuous frame support and to bring frame to proper level. Shimming is not allowed.
  - 7. Locate anchors at interval recommended by manufacturer, but not less than 3 inches (75 mm) from each end and not more than 24 inches (600 mm) o.c.
- C. Seals in Metal Frames: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
  - 1. Provide in continuous lengths for straight sections.
  - 2. Seal transitions according to manufacturer's written instructions. Vulcanize or heat-weld field-spliced joints as recommended by manufacturer.
  - 3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure-sensitive tape as recommended by manufacturer.
- D. Compression Seals: Apply adhesive or lubricant adhesive as recommended by manufacturer to both frame interfaces and sides of slabs before installing compression seals.
- E. Terminate exposed ends of joint assemblies with field- or factory-fabricated termination devices.
- F. Water Barrier: Provide water barrier at exterior joints and where called for on Drawings. Provide drainage fittings at a maximum of 50 feet (15.2 m) or where indicated.

### 3.4 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
- B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary

protection over joints. Reinstall cover plates or seals prior to Substantial Completion of the Work.

END OF SECTION 079500