



CITY OF DULUTH

**BEST VALUE PROCUREMENT
REQUEST FOR PROPOSALS FOR**

HISTORIC WINDOW REPLACEMENT

RFP NUMBER 21-AA31 (Third Issuance)

ISSUED December 28, 2021

PROPOSALS DUE Tuesday, January 11, 2022

SUBMIT TO

**CITY OF DULUTH
ATTN: PURCHASING DIVISION
CITY HALL, ROOM 120
411 WEST 1ST STREET
DULUTH, MN 55802**

PART I - GENERAL INFORMATION

I-1. Project Overview. The City of Duluth is issuing a best value procurement request for proposals for replacement of historic windows on behalf of The Burnham Project. The successful proposer will contract directly with Gardner Builders, The Burnham Project's general contractor. The City and the Burnham Project have cooperatively requested grant funds from the State of Minnesota; no contract will be executed until an award determination is provided by the State. In addition, if the grant funds are awarded to the City and The Burnham Project, no contract will be executed until the grant award agreement has been fully executed. This is anticipated in January of 2022.

The scope of work includes all labor, materials, equipment & incidentals necessary to furnish & install all exterior windows. The selected trade partner is to include all window frames, glazing, hardware, break metal trims, mounting blocks, fasteners, backer rods, sealants & incidentals necessary for a complete, fully functioning, water tight & weather proof installation.

Additional detail is provided in **Part IV** of this RFP.

I-2. Calendar of Events. The City will make every effort to adhere to the following schedule:

| Activity | Date |
|--|-----------|
| Deadline to submit Questions via email to purchasing@duluthmn.gov is 12:00 NOON on this date. | 1/5/2022 |
| Answers to questions will be posted to the City website no later than this date. | 1/6/2022 |
| Proposals must be received in the Purchasing Office by 4:30 PM on this date. | 1/11/2022 |

I-3. Rejection of Proposals. The City reserves the right, in its sole and complete discretion, to reject any and all proposals or cancel the request for proposals, at any time prior to the time a contract is fully executed, when it is in its best interests. The City is not liable for any costs the Bidder incurs in preparation and submission of its proposal, in participating in the RFP process or in anticipation of award of the contract.

I-4. Questions & Answers. Any questions regarding this RFP must be submitted by e-mail to the Purchasing Office at purchasing@duluthmn.gov **no later than** the date indicated on the Calendar of Events. Answers to the questions will be posted as an Addendum to the RFP.

I-5. Addenda to the RFP. If the City deems it necessary to revise any part of this RFP before the proposal response date, the City will post an addendum to its website <http://www.duluthmn.gov/purchasing/bids-request-for-proposals/> . Although an e-mail

notification will be sent, it is the Bidder's responsibility to periodically check the website for any new information

I-6. Proposals. To be considered, hard copies of proposals must arrive at the City on or before the time and date specified in the RFP Calendar of Events. The City will not accept proposals via email or facsimile transmission. The City reserves the right to reject or to deduct evaluation points for late proposals.

Proposals must be signed by an authorized official. If the official signs the Proposal Cover Sheet attached as Appendix A, this requirement will be met. Proposals must remain valid for 90 days or until a contract is fully executed.

Please submit one (1) paper copy of the Technical Submittal and one (1) paper copy of the Cost Submittal. The Cost Submittal should be in a separate sealed envelope. In addition, Bidders shall submit one copy of the entire proposal (Technical and Cost submittals, along with all requested documents) on flash drive in Microsoft Office-compatible or pdf format.

All materials submitted in response to this RFP will become property of the City and will become public record after the evaluation process is completed and an award decision made.

I-7.Small Diverse Business Information. The City encourages participation by minority, women, and veteran-owned businesses as prime contractors, and encourages all prime contractors to make a significant commitment to use minority, women, veteran-owned and other disadvantaged business entities as subcontractors and suppliers. A list of certified Disadvantaged Business Enterprises is maintained by the Minnesota Unified Certification Program at <http://mnuccp.metc.state.mn.us/> .

I-8. Term of Contract. The term of the contract will begin once the contract is fully executed and is anticipated to end by October 2022. The selected Bidder shall not start the performance of any work nor shall the City be liable to pay the selected Bidder for any service or work performed or expenses incurred before the contract is executed.

I-9. Prompt Payment of Subconsultants. Per MN Statute 471.425, Subd. 4a., Each contract of a municipality must require the prime contractor to pay any subcontractor within ten days of the prime contractor's receipt of payment from the municipality for undisputed services provided by the subcontractor. The contract must require the prime contractor to pay interest of 1-1/2 percent per month or any part of a month to the subcontractor on any undisputed amount not paid on time to the subcontractor. The minimum monthly interest penalty payment for an unpaid balance of \$100 or more is \$10. For an unpaid balance of less than \$100, the prime contractor shall pay the actual penalty due to the subcontractor. A subcontractor who prevails in a civil action to collect interest penalties from a prime contractor must be awarded its costs and disbursements, including attorney's fees, incurred in bringing the action.

I-10. Mandatory Disclosures. By submitting a proposal, each Bidder understands, represents, and acknowledges that:

- A. Their proposal has been developed by the Bidder independently and has been submitted without collusion with and without agreement, understanding, or planned common course of action with any other vendor or suppliers of materials, supplies, equipment, or services described in the Request for Proposals, designed to limit independent bidding or competition, and that the contents of the proposal have not been communicated by the Bidder or its employees or agents to any person not an employee or agent of the Bidder.
- B. There is no conflict of interest. A conflict of interest exists if a Bidder has any interest that would actually conflict, or has the appearance of conflicting, in any manner or degree with the performance of work on the project. If there are potential conflicts, identify the municipalities, developers, and other public or private entities with whom your company is currently, or have been, employed and which may be affected.
- C. It is not currently under suspension or debarment by the State of Minnesota, any other state or the federal government.
- D. The company is either organized under Minnesota law or has a Certificate of Authority from the Minnesota Secretary of State to do business in Minnesota, in accordance with the requirements in M.S. 303.03.

I-11. Notification of Selection. Bidders whose proposals are not selected will be notified in writing.

PART II - PROPOSAL REQUIREMENTS

Proposals must be submitted in accordance with paragraph I-6 above, and must include the following items:

- Completed Appendix A Cover Sheet
- Completed Appendix B Bid Form & Additional Qualifications, and all required attachments indicated in the form.
- Bid Bond or Surety in the amount of 5% of the total proposed amount as indicated in Part V
- Completed Responsible Contractor Verification and Certification of Compliance including Attachment A-1 First Tier Subcontractors List

PART III - CRITERIA FOR SELECTION

The proposals will be reviewed by a team comprised of members of various stakeholders in the project, which may include Gardner Builders, The Burnham Project, the City of Duluth, and LHB. The intent of the selection process is to review proposals and make an award based upon qualifications as described therein. A 100-point scale will be used to create the final evaluation recommendations. The factors and weighting on which proposals will be judged are:

| | |
|--|-----|
| Qualifications of the Bidder and Personnel | 40% |
| Prior experience with similar work | 30% |
| Cost | 30% |

PART IV – PROJECT DETAIL

The base scope shall include installation of all new exterior windows as indicated throughout drawings and specifications. This includes all labor, materials, equipment, incidentals and permits necessary to complete installation to a water-tight, weather-proof, fully functioning, and code compliant condition.

The respondent is responsible to furnish & install window types W1, W2, W3, W4, W5, W6 (including exhaust louver), & W7 as show on A5.30 and additional drawings and specifications. The respondent shall furnish & install all break metal trims, mounting blocks, backer rod and sealants, window frames, hardware, glazing and screens as indicated on A5.31 and in additional drawings and specifications.

All shop drawings and submittals shall be issued to Gardner Builders within 10 days of award.

During construction activities, the respondent shall be responsible for daily cleanup of their work to dumpsters provided onsite by Gardner Builders.

Add Alternate #01 Existing Window Removal: The respondent is to complete demolition activities of all exterior windows as noted on drawings D1.00-D2.01 (also reference A5.31 & A5.32 for description of what elements are to remain). Window bar demolition is to be excluded. The respondent is responsible for demolition, removal, and disposal (including all dumpsters) of all exterior windows. As part of these services, the respondent is responsible for temporary board up of all windows in between demolition and installation activities. Temporary board up shall be installed weather tight to prevent the elements from impacting interior construction activities.

PART V – CONTRACT REQUIREMENTS

Please note that the following requirements also apply to this project, and will be required to execute a contract with the awarded proposer.

In addition to the information below, a grant has been requested for this project. Should the grant be awarded, additional terms, conditions, and provisions may be applicable.

Declaration of Non-Collusion – The successful bidder shall be required to execute the attached affidavit stating that he/she has not entered into a collusive agreement with any other person, firm, or corporation in regard to any bid submitted.

Affirmative Action/EEO - The contractor must take affirmative action to ensure that the employees and applicants for employment are not discriminated against because of their race, color, creed, sex or national origin, and must meet the affirmative action goals. Contractors are encouraged to subcontract with Disadvantaged Business Enterprises (DBEs) when possible. A current list of certified DBEs is available on the Minnesota Unified Certification website at <https://mnuccp.metc.state.mn.us>. Contractor will comply with all applicable Equal Employment Opportunity laws and regulations. Awarded contractor will submit the attached Equal Employment Opportunity (EEO) Affirmative Action Policy Statement & Compliance Certificate.

Project Labor Agreement (PLA) - A PLA will be required for any bid that is over or could virtually go over \$150,000. A sample of the Project Labor Agreement is available at <https://www.duluthmn.gov/purchasing/forms/>.

Community Benefits Provisions - A Community Benefits Best Efforts Plan will be required for any project that includes a PLA. Information on the Community Benefits program is available at <https://www.duluthmn.gov/purchasing/forms/>.

Prevailing Wage – Pursuant to Minnesota Statutes 177.41 to 177.44 and corresponding Minnesota Rules 5200.1000 to 5200.1120, not less than the minimum salaries and prevailing wages as set forth in the attached wage decisions and Labor Cost for Bidding Form must be paid on this project. Failure to comply with the aforementioned may result in civil or criminal penalties.

ATTACHMENTS

- General Bid Specifications
- Labor Cost Bidding Data
- Prevailing Wage Decision
- Responsible Contractor Form
- Declaration of Non-collusion
- EEO Form
- Notice to Bidders - bid rigging

**APPENDIX A – Cover Sheet
CITY OF DULUTH
RFP# 21-AA31 (Third Issuance)**

| Bidder Information: | |
|---------------------------------|--|
| Bidder Name | |
| Mailing Address | |
| Contact Person | |
| Contact Person's Phone Number | |
| Contact Person's E-Mail Address | |
| Federal ID Number | |
| Authorized Signature | |
| Name of Authorized Signer | |
| Title of Authorized Signer | |
| Email of Authorized Signer | |

APPENDIX B – Bid Form & Additional Qualifications

| Bid Form | |
|--|----|
| Base Bid Amount: | \$ |
| Alternate #01 Existing Window Removal Amount (base bid still valid if no value entered here): | \$ |
| Bidder acknowledges project labor agreement, community benefits reporting, certified payroll, prevailing wage rates, and performance & payment bond requirements for this project. Bidder has included all costs associated with these requirements in the base bid: | |
| The bidder acknowledges that they will be contracted directly to Gardner Builders Duluth, LLC; but that further reporting of may be required to the City of Duluth at later dates: | |
| Bidder acknowledges insurance requirements of \$5,000,000 General Liability Insurance and \$5,000,000 Pollution Insurance. Bidder has included all costs and premiums for these insurances in the base bid and will provide evidence of insurance upon award. | |
| Bidder has submitted a bid surety in the amount of 5% of the bid. | |
| Bidder has attached a completed Responsible Contractor Verification and Certification of Compliance including Attachment A-1 First Tier Subcontractors List. | |
| Additional Qualifications | |
| How many historical renovations have been completed by the bidder in the past five years? | |
| How many of the projects were completed on time? | |
| How many of the projects were completed within budget? | |
| Attach a description of at least three historical renovations completed at any time, including type of work, value of the project, and how they compare to the project being bid. | |
| Attach a resume for the project manager, and any other supervisory staff. | |
| Attach a list of three references. | |
| Bidder is allowed to submit work plans, resumes, and additional response documentation to assist in the selection process. Please include any additional documentation with the bid proposal. | |



GENERAL BID SPECIFICATIONS

Purchasing Division
120 City Hall, 411 W. 1st Street
Duluth, MN 55802-1189
TEL. 218-730-5340
purchasing@duluthmn.gov

1. **General.** This document covers quotes or bids requested by the City of Duluth ("City"), including those requested on behalf of its Agents and Authorities. Each authority may issue their own purchase order or contract and will be responsible for it. The City of Duluth Authorities are as follows:
 - a. Duluth Airport Authority
 - b. Spirit Mountain Recreational Area Authority
 - c. Duluth Entertainment and Convention Center
 - d. Duluth Transit Authority
 - e. Duluth Economic Development Authority
 - f. Duluth Housing and Redevelopment Authority
2. **Investigation by Bidders.** Bidders are responsible for thoroughly reading and understanding the information, instructions, and specifications contained in this Invitation for Bids, and for investigating the site conditions at the Project location(s), if applicable. At the time of the opening of bids, each bidder will be presumed to have read and to be thoroughly familiar with the plans, specifications and contract documents (including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall in no way relieve the bidder from any obligation in respect to their bid.
3. **Bidder Questions.** Responses to general questions regarding the Invitation for Bids may be made at the discretion of the City. Every request for such interpretation should be in writing and delivered via e-mail or postal mail to the Purchasing Division before the deadline indicated on the Invitation for Bids, or if no deadline is specified, at least five (5) days prior to the scheduled bid opening. Responses will be issued in writing in the form of an Addenda or e-mail to prospective bidders.
4. **Changes, Corrections & Withdrawal of Bids.** Erasures or other changes to the bid must be initialed and dated, however no special conditions shall be made or included in the bid form by the bidder. Bidders may make requests to withdraw/replace their bids by notifying the Purchasing Division in writing prior to the bid opening date and time.
5. **Unit Pricing.** If the total bid price is based on unit pricing, the City will verify the extended bid price for each item (obtained by multiplying the unit bid price by the bid item quantity). If any item is incorrectly calculated, the City will use the unit bid price to recalculate the extended item price and the total bid price.
6. **Sales Tax.** Do not include sales tax in the unit price. A sales tax exemption certificate will be provided upon request.
7. **Bid/Quote Submission.** Bids may be mailed to the Purchasing Office, City Hall, 411 West 1st Street, Room 120, Duluth, MN 55802, or dropped off in person at the same address. Bids must be received by Purchasing before the time and date specified in the invitation for bid.
8. **Non-Collusion Clause.** By submitting a bid, the bidder, their agent and/or employee(s) hereby affirm that the attached bid or bids have been arrived at by the bidder independently and have been submitted without collusion with, and without agreement, understanding or planned common course of action with any other vendor of materials, supplies, equipment or services described in the Invitation for Bids, designed to limit independent bidding or competition
9. **Award.** Award, if made, will be to the responsible bidder submitting the lowest bid which complies with the conditions of the Invitation for Bids and specifications.
10. **Bidder Qualifications.** Per Sec 41.23(e) of Duluth City Code, price may not be the only consideration for award. The City will make such investigations as deemed necessary to determine the ability, capacity and skill of the bidder to perform the work and perform it in the time specified without delay or interference, the character, integrity, reputation, judgment, experience and efficiency of the bidder, the quality of the bidder's performance of previous contracts or services, and the sufficiency of the financial resources, equipment available and ability of the bidder to perform the contract. Bidders shall furnish to the City all such information and data for this purpose, when requested.

Minnesota law requires that, in order to transact business in the State, including submitting a response to this request for bids/proposals, a corporate entity of any kind must either be organized under Minnesota law or have a Certificate of Authority from the Minnesota Secretary of State to do business in Minnesota (M.S. 303.03) By submitting this bid/proposal as a corporation, you are certifying that the responding corporation complies with this requirement.
11. **Rejection of Bids.** The City of Duluth reserves the right to reject any and all bids and to waive any informalities or irregularities in bids received whenever such rejection or waiver is in its best interests.

The City reserves the right to reject any bid if the evidence obtained by the City through such investigation fails to satisfy the City that the bidder is properly qualified to carry out the obligations of the contract and to complete the work as required by the plans and specifications.
12. **Liquidated Damages for Failure to Enter into Contract.** The successful bidder, upon their failure or refusal to accept a purchase order or execute and deliver the contract, proof of insurance and bonds required within 10 days after receipt of a notice of the acceptance of their bid, shall forfeit to the City, as liquidated damages for such failure or refusal, the security deposited with their bid (if required).
13. **Equal Employment Opportunity.** Contractor will be required to comply with all applicable Equal Employment Opportunity (EEO) laws and regulations. Affirmative action must be taken to insure that the employees and applicants for employment are not discriminated against because of their race, color, creed, sex or national origin. The City of Duluth is an equal opportunity employer.
14. **Quantities.** The City reserves the right to increase or decrease the quantities of items within reason, unless otherwise noted.
15. **Prevailing Wages.** Per Sec 2-26 of Duluth City Code, payment of not less than the prevailing wage and salary rates specified in the contract documents and the conditions of employment with respect to certain categories and classifications of employees is required for all "Public Works" type projects estimated to exceed \$2,000. This does not apply to off-site production and manufacturing of parts and supplies.
16. **Validity of Bids:** All bids must remain firm for 60 days from the date of bid opening, unless another period is noted in bid documents or if an extension is agreed upon, in writing prior to the end of the 60-day period.
17. **Insurance.** All vendors doing work on City property, except vendors making routine deliveries, shall submit an insurance certificate verifying insurance coverage as per current City requirements.
18. **Reports.** Contractors will be required to provide all data required by the city, state or federal funding source(s) for reporting purposes; including, but not limited to job creation and retention data, itemized invoices, payroll records, certifications and licenses.



Purchasing Division
Finance Department
Room 120
411 West First Street
Duluth, Minnesota 55802

218-730-5340
purchasing@duluthmn.gov

LABOR COST BIDDING DATA

Solicitation No.: 21-AA31
Project Title: Historic Window Replacement

Funding sources for City of Duluth projects determine what wages and work hours are required. The project identified above includes the funding sources checked below.

- Federal funds
- State funds
- City funds
- Other:

Per the Duluth City Code, prevailing wages must be paid on projects over \$2,000. The prevailing wage decisions included in this project are listed below. If multiple wage decisions cover the work, bidders are required to pay the higher wage:

1. MN State Commercial Wage Rate for St. Louis County, revised 12/27/21

This project will include a project labor agreement (PLA) if over \$150,000. Please note that union scale wages are not always higher than the prevailing wages required.

Overtime rate to be paid at no less than 1 ½ times the rate of pay, plus fringe, as established in the project's wage decision OR 1 ½ times the base rate the employee is being paid, plus fringe; whichever is higher. Overtime must be paid on:

- hours worked in excess of 8 hours per day (even if less than 40 hours worked in a week) and hours worked in excess of 40 hours per week
- hours worked in excess of 40 hours per week
- hours worked in excess of 8 hours per day and 40 hours per week, unless the bidder has an existing union labor agreement allowing different hours as prescribed in section 2-26 of the City Code.

MINNESOTA DEPARTMENT OF LABOR AND INDUSTRY PREVAILING WAGES FOR STATE FUNDED CONSTRUCTION PROJECTS



THIS NOTICE MUST BE POSTED ON THE JOBSITE IN A CONSPICUOUS PLACE

Construction Type: Commercial

County Number: 69

County Name: ST. LOUIS

Effective: 2021-12-27

This project is covered by Minnesota prevailing wage statutes. Wage rates listed below are the minimum hourly rates to be paid on this project.

All hours worked in excess of eight (8) hours per day or forty (40) hours per week shall be paid at a rate of one and one half (1 1/2) times the basic hourly rate. *Note: Overtime pay after eight (8) hours on the project must be paid even if the worker does not exceed forty (40) hours in the work week.*

Violations should be reported to:

Department of Labor and Industry
 Prevailing Wage Section
 443 Lafayette Road N
 St Paul, MN 55155
 (651) 284-5091
DLI.PrevWage@state.mn.us

* Indicates that adjacent county rates were used for the labor class listed.

County: ST. LOUIS (69)

| LABOR CODE AND CLASS | EFFECT DATE | BASIC RATE | FRINGE RATE | TOTAL RATE | |
|--|---|------------|-------------|------------|-------|
| LABORERS (101 - 112) (SPECIAL CRAFTS 701 - 730) | | | | | |
| 101 | LABORER, COMMON (GENERAL LABOR WORK) | 2021-12-27 | 28.72 | 20.94 | 49.66 |
| | | 2022-05-01 | 29.92 | 21.69 | 51.61 |
| 102 | LABORER, SKILLED (ASSISTING SKILLED CRAFT JOURNEYMAN) | 2021-12-27 | 28.72 | 20.94 | 49.66 |
| | | 2022-05-01 | 29.92 | 21.69 | 51.61 |
| 103 | LABORER, LANDSCAPING (GARDENER, SOD LAYER AND NURSERY OPERATOR) | 2021-12-27 | 25.75 | 18.70 | 44.45 |
| 104 | FLAG PERSON | 2021-12-27 | 28.72 | 20.94 | 49.66 |
| 105 | WATCH PERSON | 2021-12-27 | 26.37 | 20.94 | 47.31 |
| 106 | BLASTER | 2021-12-27 | 27.22 | 19.29 | 46.51 |

| LABOR CODE AND CLASS | EFFECT DATE | BASIC RATE | FRINGE RATE | TOTAL RATE | |
|--------------------------------------|--|--|-------------|------------|-------|
| 107 | PIPELAYER (WATER, SEWER AND GAS) | 2021-12-27 | 37.63 | 22.02 | 59.65 |
| | | 2022-05-01 | 39.03 | 22.67 | 61.70 |
| 108 | TUNNEL MINER | FOR RATE CALL 651-284-5091 OR EMAIL DLI.PREVVAGE@STATE.MN.US | | | |
| 109 | UNDERGROUND AND OPEN DITCH LABORER (EIGHT FEET BELOW STARTING GRADE LEVEL) | 2021-12-27 | 35.63 | 22.02 | 57.65 |
| | | 2022-05-01 | 37.03 | 22.67 | 59.70 |
| 110 | SURVEY FIELD TECHNICIAN (OPERATE TOTAL STATION, GPS RECEIVER, LEVEL, ROD OR RANGE POLES, STEEL TAPE MEASUREMENT; MARK AND DRIVE STAKES; HAND OR POWER DIGGING FOR AND IDENTIFICATION OF MARKERS OR MONUMENTS; PERFORM AND CHECK CALCULATIONS; REVIEW AND UNDERSTAND CONSTRUCTION PLANS AND LAND SURVEY MATERIALS). THIS CLASSIFICATION DOES NOT APPLY TO THE WORK PERFORMED ON A PREVAILING WAGE PROJECT BY A LAND SURVEYOR WHO IS LICENSED PURSUANT TO MINNESOTA STATUTES, SECTIONS 326.02 TO 326.15. | 2021-12-27 | 28.72 | 20.94 | 49.66 |
| | | 2022-05-01 | 29.92 | 21.69 | 51.61 |
| 111* | TRAFFIC CONTROL PERSON (TEMPORARY SIGNAGE) | 2021-12-27 | 28.72 | 20.94 | 49.66 |
| SPECIAL EQUIPMENT (201 - 204) | | | | | |
| 201 | ARTICULATED HAULER | 2021-12-27 | 41.73 | 22.85 | 64.58 |
| 202 | BOOM TRUCK | 2021-12-27 | 41.73 | 22.85 | 64.58 |
| 203* | LANDSCAPING EQUIPMENT, INCLUDES HYDRO SEEDER OR MULCHER, SOD ROLLER, FARM TRACTOR WITH ATTACHMENT SPECIFICALLY SEEDING, SODDING, OR PLANT, AND TWO-FRAMED FORKLIFT (EXCLUDING FRONT, POSIT-TRACK, AND SKID STEER | 2021-12-27 | 24.00 | 16.96 | 40.96 |

| LABOR CODE AND CLASS | EFFECT DATE | BASIC RATE | FRINGE RATE | TOTAL RATE |
|---|-------------|------------|-------------|------------|
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| 204 | 2021-12-27 | 33.65 | 19.95 | 53.60 |
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| 205 | 2021-12-27 | 26.91 | 19.87 | 46.78 |
| HIGHWAY/HEAVY POWER EQUIPMENT OPERATOR | | | | |
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| GROUP 2 | 2021-12-27 | 39.74 | 21.55 | 61.29 |
| 306 | | | | |
| 308 | | | | |
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| GROUP 3 | 2021-12-27 | 40.34 | 22.55 | 62.89 |
| | 2022-05-02 | 41.59 | 23.45 | 65.04 |
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| GROUP 4 | 2021-12-27 | 40.04 | 22.55 | 62.59 |
| | 2022-05-02 | 41.29 | 23.45 | 64.74 |
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| LABOR CODE AND CLASS | EFFECT DATE | BASIC RATE | FRINGE RATE | TOTAL RATE |
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| GROUP 5 | 2021-12-27 | 35.85 | 21.55 | 57.40 |
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| LABOR CODE AND CLASS | EFFECT DATE | BASIC RATE | FRINGE RATE | TOTAL RATE |
|--|---|------------|-------------|------------|
| GROUP 6 | 2021-12-27 | 35.79 | 22.55 | 58.34 |
| 387 | CAT, CHALLENGER, OR SIMILAR TYPE OF TRACTORS, WHEN PULLING DISK OR ROLLER | | | |
| 389 | DREDGE DECK HAND | | | |
| 391 | GRAVEL SCREENING PLANT (PORTABLE NOT CRUSHING OR WASHING) | | | |
| 393 | LEVER PERSON | | | |
| 395 | POWER SWEEPER | | | |
| 396 | SHEEP FOOT ROLLER AND ROLLERS ON GRAVEL COMPACTION, INCLUDING VIBRATING ROLLERS | | | |
| 397 | TRACTOR, WHEEL TYPE, OVER 50 H.P., UNRELATED TO LANDSCAPING | | | |
| COMMERCIAL POWER EQUIPMENT OPERATOR | | | | |
| GROUP 1 | 2021-12-27 | 45.24 | 22.85 | 68.09 |
| 501 | HELICOPTER PILOT (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 502 | TOWER CRANE 250 FEET AND OVER (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 503 | TRUCK CRAWLER CRANE WITH 200 FEET OF BOOM AND OVER, INCLUDING JIB (COMMERCIAL CONSTRUCTION ONLY) | | | |
| GROUP 2 | 2021-12-27 | 44.90 | 22.85 | 67.75 |
| 504 | CONCRETE PUMP WITH 50 METERS/164 FEET OF BOOM AND OVER (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 505 | PILE DRIVING WHEN THREE DRUMS IN USE (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 506 | TOWER CRANE 200 FEET AND OVER (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 507 | TRUCK OR CRAWLER CRANE WITH 150 FEET OF BOOM UP TO AND NOT INCLUDING 200 FEET, INCLUDING JIB (COMMERCIAL CONSTRUCTION ONLY) | | | |
| GROUP 3 | 2021-12-27 | 43.49 | 22.85 | 66.34 |
| 508 | ALL-TERRAIN VEHICLE CRANES (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 509 | CONCRETE PUMP 32-49 METERS/102-164 FEET (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 510 | DERRICK (GUY & STIFFLEG) (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 511 | STATIONARY TOWER CRANE UP TO 200 FEET | | | |
| 512 | SELF-ERECTING TOWER CRANE 100 FEET AND OVER MEASURED FROM BOOM FOOT PIN (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 513 | TRAVELING TOWER CRANE (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 514 | TRUCK OR CRAWLER CRANE UP TO AND NOT INCLUDING 150 FEET OF BOOM, INCLUDING JIB (COMMERCIAL CONSTRUCTION ONLY) | | | |
| GROUP 4 | 2021-12-27 | 43.15 | 22.85 | 66.00 |
| 515 | CRAWLER BACKHOE INCLUDING ATTACHMENTS (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 516 | FIREPERSON, CHIEF BOILER LICENSE (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 517 | HOIST ENGINEER (THREE DRUMS OR MORE) (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 518 | LOCOMOTIVE (COMMERCIAL CONSTRUCTION ONLY) | | | |
| 519 | OVERHEAD CRANE (INSIDE BUILDING PERIMETER) (COMMERCIAL CONSTRUCTION ONLY) | | | |

| LABOR CODE AND CLASS | EFFECT DATE | BASIC RATE | FRINGE RATE | TOTAL RATE |
|----------------------|-------------|------------|-------------|------------|
| 520 | | | | |
| | | | | |
| GROUP 5 | 2021-12-27 | 41.73 | 22.85 | 64.58 |
| 521 | | | | |
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| GROUP 6 | 2021-12-27 | 40.22 | 22.85 | 63.07 |
| 535 | | | | |
| 536 | | | | |
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| 538 | | | | |
| 539 | | | | |
| 540 | | | | |
| GROUP 7 | 2021-12-27 | 39.10 | 22.85 | 61.95 |
| 541 | | | | |
| 542 | | | | |
| 543 | | | | |
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| 545 | | | | |
| 546 | | | | |
| 547 | | | | |
| GROUP 8 | 2021-12-27 | 37.09 | 22.85 | 59.94 |

| LABOR CODE AND CLASS | EFFECT DATE | BASIC RATE | FRINGE RATE | TOTAL RATE |
|-----------------------|-------------|------------|-------------|------------|
| 548 | | | | |
| | | | | |
| 549 | | | | |
| 550 | | | | |
| TRUCK DRIVERS | | | | |
| GROUP 1 * | 2021-12-27 | 33.65 | 19.95 | 53.60 |
| 601 | | | | |
| 602 | | | | |
| 603 | | | | |
| GROUP 2 | 2021-12-27 | 29.70 | 16.60 | 46.30 |
| 604 | | | | |
| GROUP 3 | 2021-12-27 | 33.00 | 19.95 | 52.95 |
| 605 | | | | |
| 606 | | | | |
| 607 | | | | |
| GROUP 4 * | 2021-12-27 | 25.10 | 10.85 | 35.95 |
| 608 | | | | |
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| 616 | | | | |
| SPECIAL CRAFTS | | | | |
| 701 | 2021-12-27 | 45.06 | 20.70 | 65.76 |
| | 2022-06-05 | 47.31 | 20.70 | 68.01 |
| 702 | 2021-12-27 | 40.94 | 29.28 | 70.22 |
| | 2022-01-01 | 42.64 | 29.28 | 71.92 |
| 703 | 2021-12-27 | 36.35 | 30.54 | 66.89 |

| LABOR CODE AND CLASS | EFFECT DATE | BASIC RATE | FRINGE RATE | TOTAL RATE | |
|----------------------|---|------------|-------------|------------|-------|
| 704 | CARPENTERS | 2021-12-27 | 32.20 | 23.58 | 55.78 |
| | | 2022-05-02 | 34.25 | 23.58 | 57.83 |
| 705 | CARPET LAYERS (LINOLEUM) | 2021-12-27 | 36.12 | 21.57 | 57.69 |
| 706 | CEMENT MASONS | 2021-12-27 | 35.76 | 20.88 | 56.64 |
| | | 2022-05-01 | 37.71 | 20.88 | 58.59 |
| 707 | ELECTRICIANS | 2021-12-27 | 41.37 | 28.84 | 70.21 |
| 708 | ELEVATOR CONSTRUCTORS | 2021-12-27 | 53.28 | 41.79 | 95.07 |
| | | 2022-01-01 | 55.10 | 43.00 | 98.10 |
| 709 | GLAZIERS | 2021-12-27 | 33.16 | 23.18 | 56.34 |
| | | 2022-05-02 | 35.16 | 23.18 | 58.34 |
| 710* | LATHERS | 2021-12-27 | 31.44 | 18.43 | 49.87 |
| 712 | IRONWORKERS | 2021-12-27 | 35.09 | 31.80 | 66.89 |
| 714 | MILLWRIGHT | 2021-12-27 | 36.10 | 23.10 | 59.20 |
| | | 2022-01-01 | 36.10 | 24.21 | 60.31 |
| | | 2022-05-02 | 38.25 | 24.21 | 62.46 |
| 715 | PAINTERS (INCLUDING HAND BRUSHED, HAND SPRAYED, AND THE TAPING OF PAVEMENT MARKINGS) | 2021-12-27 | 33.64 | 22.34 | 55.98 |
| | | 2022-05-01 | 35.69 | 22.34 | 58.03 |
| 716 | PILEDRIIVER (INCLUDING VIBRATORY DRIVER OR EXTRACTOR FOR PILING AND SHEETING OPERATIONS) | 2021-12-27 | 40.00 | 26.04 | 66.04 |
| | | 2022-05-02 | 42.15 | 26.04 | 68.19 |
| 717 | PIPEFITTERS . STEAMFITTERS | 2021-12-27 | 41.40 | 23.95 | 65.35 |
| | | 2022-05-01 | 43.55 | 23.95 | 67.50 |
| 718 | PLASTERERS | 2021-12-27 | 36.24 | 21.13 | 57.37 |
| 719 | PLUMBERS | 2021-12-27 | 41.40 | 23.95 | 65.35 |

| LABOR CODE AND CLASS | | EFFECT DATE | BASIC RATE | FRINGE RATE | TOTAL RATE |
|----------------------|---------------------------|-------------|------------|-------------|------------|
| | | 2022-05-02 | 43.55 | 23.95 | 67.50 |
| 720 | ROOFER | 2021-12-27 | 33.22 | 15.59 | 48.81 |
| | | 2022-05-01 | 35.17 | 15.59 | 50.76 |
| 721 | SHEET METAL WORKERS | 2021-12-27 | 35.07 | 27.92 | 62.99 |
| 722* | SPRINKLER FITTERS | 2021-12-27 | 39.18 | 23.22 | 62.40 |
| 723 | TERRAZZO WORKERS | 2021-12-27 | 41.96 | 22.50 | 64.46 |
| 724 | TILE SETTERS | 2021-12-27 | 31.28 | 26.24 | 57.52 |
| 725 | TILE FINISHERS | 2021-12-27 | 21.72 | 21.21 | 42.93 |
| 726 | DRYWALL TAPER | 2021-12-27 | 33.64 | 22.44 | 56.08 |
| | | 2022-05-01 | 35.69 | 22.44 | 58.13 |
| 727 | WIRING SYSTEM TECHNICIAN | 2021-12-27 | 42.46 | 19.41 | 61.87 |
| | | 2022-07-01 | 43.52 | 19.41 | 62.93 |
| 728 | WIRING SYSTEMS INSTALLER | 2021-12-27 | 29.75 | 16.08 | 45.83 |
| | | 2022-07-01 | 30.49 | 16.08 | 46.57 |
| 729 | ASBESTOS ABATEMENT WORKER | 2021-12-27 | 33.98 | 20.75 | 54.73 |
| | | 2022-01-01 | 35.13 | 21.55 | 56.68 |
| 730 | SIGN ERECTOR | 2021-12-27 | 30.67 | 17.65 | 48.32 |
| | | 2022-06-01 | 32.17 | 17.65 | 49.82 |

**ATTACHMENT A
PRIME CONTRACTOR RESPONSE**

RESPONSIBLE CONTRACTOR VERIFICATION AND CERTIFICATION OF COMPLIANCE

PROJECT NUMBER: _____

This form includes changes by statutory references from the Laws of Minnesota 2015, chapter 64, sections 1-9. This form must be submitted with the response to this solicitation. A response received without this form, will be rejected.

| | |
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| <p>Minn. Stat. § 16C.285, Subd. 7. IMPLEMENTATION. ... any prime contractor or subcontractor or motor carrier that does not meet the minimum criteria in subdivision 3 or fails to verify that it meets those criteria is not a responsible contractor and is not eligible to be awarded a construction contract for the project or to perform work on the project...</p> | |
| <p>Minn. Stat. § 16C.285, Subd. 3. RESPONSIBLE CONTRACTOR, MINIMUM CRITERIA. "Responsible contractor" means a contractor that conforms to the responsibility requirements in the solicitation document for its portion of the work on the project and verifies that it meets the following minimum criteria:</p> | |
| (1) | <p>The Contractor:</p> <ul style="list-style-type: none">(i) is in compliance with workers' compensation and unemployment insurance requirements;(ii) is in compliance with Department of Revenue and Department of Employment and Economic Development registration requirements if it has employees;(iii) has a valid federal tax identification number or a valid Social Security number if an individual; and(iv) has filed a certificate of authority to transact business in Minnesota with the Secretary of State if a foreign corporation or cooperative. |
| (2) | <p>The contractor or related entity is in compliance with and, during the three-year period before submitting the verification, has not violated section 177.24, 177.25, 177.41 to 177.44, 181.03, 181.101, 181.13, 181.14, or 181.722, and has not violated United States Code, title 29, sections 201 to 219, or United States Code, title 40, sections 3141 to 3148. For purposes of this clause, a violation occurs when a contractor or related entity:</p> <ul style="list-style-type: none">(i) repeatedly fails to pay statutorily required wages or penalties on one or more separate projects for a total underpayment of \$25,000 or more within the three-year period, provided that a failure to pay is "repeated" only if it involves two or more separate and distinct occurrences of underpayment during the three-year period;(ii) has been issued an order to comply by the commissioner of Labor and Industry that has become final;(iii) has been issued at least two determination letters within the three-year period by the Department of Transportation finding an underpayment by the contractor or related entity to its own employees;(iv) has been found by the commissioner of Labor and Industry to have repeatedly or willfully violated any of the sections referenced in this clause pursuant to section 177.27;(v) has been issued a ruling or findings of underpayment by the administrator of the Wage and Hour Division of the United States Department of Labor that have become final or have been upheld by an administrative law judge or the Administrative Review Board; or(vi) has been found liable for underpayment of wages or penalties or misrepresenting a construction worker as an independent contractor in an action brought in a court having jurisdiction. Provided that, if the contractor or related entity contests a determination of underpayment by the Department of Transportation in a contested case proceeding, a violation does not occur until the contested case proceeding has concluded with a determination that the contractor or related entity underpaid wages or penalties;*(vii) has been convicted of a violation of section 609.52, subd 2 (19). |

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| (3) | The contractor or related entity is in compliance with and, during the three-year period before submitting the verification, has not violated section 181.723 or chapter 326B. For purposes of this clause, a violation occurs when a contractor or related entity has been issued a final administrative or licensing order;* |
| (4) | The contractor or related entity has not, more than twice during the three-year period before submitting the verification, had a certificate of compliance under section 363A.36 revoked or suspended based on the provisions of section 363A.36, with the revocation or suspension becoming final because it was upheld by the Office of Administrative Hearings or was not appealed to the office;* |
| (5) | The contractor or related entity has not received a final determination assessing a monetary sanction from the Department of Administration or Transportation for failure to meet targeted group business, disadvantaged business enterprise, or veteran-owned business goals, due to a lack of good faith effort, more than once during the three-year period before submitting the verification;* |
| | * Any violations, suspensions, revocations, or sanctions, as defined in clauses (2) to (5), occurring prior to July 1, 2014, shall not be considered in determining whether a contractor or related entity meets the minimum criteria. |
| (6) | The contractor or related entity is not currently suspended or debarred by the federal government or the state of Minnesota or any of its departments, commissions, agencies, or political subdivisions that have authority to debar a contractor; and |
| (7) | All subcontractors and motor carriers that the contractor intends to use to perform project work have verified to the contractor through a signed statement under oath by an owner or officer that they meet the minimum criteria listed in clauses (1) to (6). |

Minn. Stat. § 16C.285, Subd. 5. **SUBCONTRACTOR VERIFICATION.**

A prime contractor or subcontractor shall include in its verification of compliance under subdivision 4 a list of all of its first-tier subcontractors that it intends to retain for work on the project. Prior to execution of a construction contract, and as a condition precedent to the execution of a construction contract, the apparent successful prime contractor shall submit to the contracting authority a supplemental verification under oath confirming compliance with subdivision 3, clause (7). Each contractor or subcontractor shall obtain from all subcontractors with which it will have a direct contractual relationship a signed statement under oath by an owner or officer verifying that they meet all of the minimum criteria in subdivision 3 prior to execution of a construction contract with each subcontractor.

If a prime contractor or any subcontractor retains additional subcontractors on the project after submitting its verification of compliance, the prime contractor or subcontractor shall obtain verifications of compliance from each additional subcontractor with which it has a direct contractual relationship and shall submit a supplemental verification confirming compliance with subdivision 3, clause (7), within 14 days of retaining the additional subcontractors.

A prime contractor shall submit to the contracting authority upon request copies of the signed verifications of compliance from all subcontractors of any tier pursuant to subdivision 3, clause (7). A prime contractor and subcontractors shall not be responsible for the false statements of any subcontractor with which they do not have a direct contractual relationship. A prime contractor and subcontractors shall be responsible for false statements by their first-tier subcontractors with which they have a direct contractual relationship only if they accept the verification of compliance with actual knowledge that it contains a false statement.

Subd. 5a. **Motor carrier verification.** A prime contractor or subcontractor shall obtain annually from all motor carriers with which it will have a direct contractual relationship a signed statement under oath by an owner or officer verifying that they meet all of the minimum criteria in subdivision 3 prior to execution of a construction contract with each motor carrier. A prime contractor or subcontractor shall require each such motor carrier to provide it with immediate written notification in the event that the motor carrier no longer meets one or more of the minimum criteria in subdivision 3 after submitting its annual verification. A motor carrier shall be ineligible to perform work on a project covered by this section if it does not meet all the minimum criteria in subdivision 3. Upon request, a prime contractor or subcontractor shall submit to the contracting authority the signed verifications of compliance from all motor carriers providing for-hire transportation of materials, equipment, or supplies for a project.

Minn. Stat. § 16C.285, Subd. 4. **VERIFICATION OF COMPLIANCE.**

A contractor responding to a solicitation document of a contracting authority shall submit to the contracting authority a signed statement under oath by an owner or officer verifying compliance with each of the minimum criteria in subdivision 3, with the exception of clause (7), at the time that it responds to the solicitation document.

A contracting authority may accept a signed statement under oath as sufficient to demonstrate that a contractor is a responsible contractor and shall not be held liable for awarding a contract in reasonable reliance on that statement. A prime contractor, subcontractor, or motor carrier that fails to verify compliance with any one of the required minimum criteria or makes a false statement under oath in a verification of compliance shall be ineligible to be awarded a construction contract on the project for which the verification was submitted.

A false statement under oath verifying compliance with any of the minimum criteria may result in termination of a construction contract that has already been awarded to a prime contractor or subcontractor or motor carrier that submits a false statement. A contracting authority shall not be liable for declining to award a contract or terminating a contract based on a reasonable determination that the contractor failed to verify compliance with the minimum criteria or falsely stated that it meets the minimum criteria. A verification of compliance need not be notarized. An electronic verification of compliance made and submitted as part of an electronic bid shall be an acceptable verification of compliance under this section provided that it contains an electronic signature as defined in section 325L.02, paragraph (h).

CERTIFICATION

By signing this document I certify that I am an owner or officer of the company, and I swear under oath that:

- 1) My company meets each of the Minimum Criteria to be a responsible contractor as defined herein and is in compliance with Minn. Stat. § 16C.285, and**
- 2) if my company is awarded a contract, I will submit Attachment A-1 prior to contract execution, and**
- 3) if my company is awarded a contract, I will also submit Attachment A-2 as required.**

Authorized Signature of Owner or Officer:

Printed Name:

Title:

Date:

Company Name:

NOTE: Minn. Stat. § 16C.285, Subd. 2, (c) If only one prime contractor responds to a solicitation document, a contracting authority may award a construction contract to the responding prime contractor even if the minimum criteria in subdivision 3 are not met.

ATTACHMENT A-1

FIRST-TIER SUBCONTRACTORS LIST

SUBMIT PRIOR TO EXECUTION OF A CONSTRUCTION CONTRACT

PROJECT NUMBER: _____

Minn. Stat. § 16C.285, Subd. 5. A prime contractor or subcontractor shall include in its verification of compliance under subdivision 4 a list of all of its first-tier subcontractors that it intends to retain for work on the project. Prior to execution of a construction contract, and as a condition precedent to the execution of a construction contract, the apparent successful prime contractor shall submit to the contracting authority a supplemental verification under oath confirming compliance with subdivision 3, clause (7). Each contractor or subcontractor shall obtain from all subcontractors with which it will have a direct contractual relationship a signed statement under oath by an owner or officer verifying that they meet all of the minimum criteria in subdivision 3 prior to execution of a construction contract with each subcontractor.

| FIRST TIER SUBCONTRACTOR NAMES* (Legal name of company as registered with the Secretary of State) | Name of city where company home office is located |
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*Attach additional sheets as needed for submission of all first-tier subcontractors.

| SUPPLEMENTAL CERTIFICATION FOR ATTACHMENT A-1 | |
|---|----------------------|
| <p>By signing this document I certify that I am an owner or officer of the company, and I swear under oath that:</p> <p>All first-tier subcontractors listed on attachment A-1 have verified through a signed statement under oath by an owner or officer that they meet the minimum criteria to be a responsible contractor as defined in Minn. Stat. § 16C.285.</p> | |
| Authorized Signature of Owner or Officer: | Printed Name: |
| Title: | Date: |
| Company Name: | |

ATTACHMENT A-2

ADDITIONAL SUBCONTRACTORS LIST

PRIME CONTRACTOR TO SUBMIT AS SUBCONTRACTORS ARE ADDED TO THE PROJECT

PROJECT NUMBER: _____

This form must be submitted to the Project Manager or individual as identified in the solicitation document.

Minn. Stat. § 16C.285, Subd. 5. ... If a prime contractor or any subcontractor retains additional subcontractors on the project after submitting its verification of compliance, the prime contractor or subcontractor shall obtain verifications of compliance from each additional subcontractor with which it has a direct contractual relationship and shall submit a supplemental verification confirming compliance with subdivision 3, clause (7), within 14 days of retaining the additional subcontractors. ...

| ADDITIONAL SUBCONTRACTOR NAMES* (Legal name of company as registered with the Secretary of State) | Name of city where company home office is located |
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*Attach additional sheets as needed for submission of all additional subcontractors.

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| SUPPLEMENTAL CERTIFICATION FOR ATTACHMENT A-2 | |
| <p>By signing this document I certify that I am an owner or officer of the company, and I swear under oath that:</p> <p>All additional subcontractors listed on Attachment A-2 have verified through a signed statement under oath by an owner or officer that they meet the minimum criteria to be a responsible contractor as defined in Minn. Stat. § 16C.285.</p> | |
| Authorized Signature of Owner or Officer: | Printed Name: |
| Title: | Date: |
| Company Name: | |

DECLARATION OF NON-COLLUSION

I hereby swear (or affirm) under penalty of perjury:

- 1) That I am the bidder (if the bidder is an individual), a partner in the bidder (if the bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the bidder is a corporation);

- 2) That the attached bid or bids have been arrived at by the bidder independently and have been submitted without collusion with and without agreement, understanding, or planned common course of action with any other vendor of materials, supplies, equipment or services described in the invitation to bid, designed to limit independent bidding or competition;

- 3) That the contents of the bid or bids have not been communicated by the bidder or its employees or agents to any person not an employee or agent of the bidder or its surety on any bond furnished with the bid or bids and will not be communicated to any such person prior to the official opening of the bid or bids;

- 4) That a family relationship between a City of Duluth employee and bidder/proposer are in non-collusion; and

- 5) That I have fully informed myself regarding the accuracy of the statements made in this declaration.

Signed: _____

Firm Name: _____

Bidder's Federal Identification Number _____

**EQUAL EMPLOYMENT OPPORTUNITY EEO AFFIRMATIVE ACTION
POLICY STATEMENT & COMPLIANCE CERTIFICATE**

TO: City of Duluth, MN PROJECT NUMBER & DESCRIPTION _____

FROM: _____

(Vendor's name, address, telephone number)

A) Employment: It is the policy of the above named FIRM to afford equal opportunity for employment to all individuals regardless of race, color, creed, religion, national origin, ancestry, age, sex, marital status, status with respect to public assistance and/or disability. The FIRM will take affirmative action to ensure that we will: (1) recruit, hire, and promote all job classifications without regard to race, color, creed, religion, national origin, ancestry, age, sex, marital status, status with respect to public assistance, and/or disability, except where sex is a bona fide occupational qualification; (2) base decisions on employment so as to further the principle of equal employment opportunity; (3) ensure that promotion decisions are in accord with the principles of equal employment opportunity by imposing only valid requirements for promotional opportunities; (4) ensure that all personnel actions such as compensation, benefits, transfers, layoffs, return from layoff, FIRM sponsored training, education tuition assistance, social and recreational programs will be administered without regard to race, color, creed, religion, national origin, ancestry, age, sex, marital status, status with respect to public assistance, and/or disability. The FIRM also intends full compliance with Veteran affirmative action requirements. Additionally, minority and female employees shall be encouraged to participate in all FIRM activities and refer applicants.

I have designated (name) _____ to direct the establishment of and to monitor the implementation of personnel procedures to guide the FIRM's affirmative action program. Where PROJECTS exceed \$500,000, this official shall also serve as the liaison officer that administers the FIRM's "Minority Business Enterprise Program." This official is charged with designing and implementing audit and reporting systems that will keep management informed on a monthly basis of the status of the equal opportunity area.

Supervisors have been made to understand that their work performance is being evaluated on the basis of their equal opportunity efforts and results, as well as other criteria. It shall be the responsibility of the FIRM and its supervisors to take actions to prevent harassment of employees placed through affirmative action efforts.

B) Reports: Unless exempted by law and regulation, the FIRM shall make available and file those reports related to equal opportunity as may be required by the City of Duluth and State and Federal compliance agencies. Requirements and Reports are defined in 41CFR60 "Compliance Responsibility for Equal Opportunity" published by the U. S. Department of Labor which is incorporated herein by reference. Additional requirements are defined in various State and Federal Civil Rights Legislation and Rules promulgated thereunder.

C) Nonsegregated Facilities: The FIRM certifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The FIRM certifies that it will not maintain or provide for its employees any segregated facilities at any of its establishments and that it will not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The FIRM 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 area, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation for entertainment area, transportation, and housing facilities provided for employees which are segregated by explicit directive or are, in fact, segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise.

- D) Affirmative Action Compliance Program:** Unless exempted by regulation and law, the FIRM—if the FIRM has 50 or more employees and if the value of current contracts with the City of Duluth exceeds \$50,000—shall prepare and maintain a written affirmative action compliance program that meets the requirement as set forth in 41CFR60.
- E) Non-Compliance:** The FIRM certifies that it is not currently in receipt of any outstanding letters of deficiencies, show cause, probable cause, or other such notification of non-compliance with EEO Laws and Regulations.
- F) Employment Goals - “Construction” Projects:** It shall be the goal of the FIRM if the PROJECT is of a construction nature that in all on-site employment generated that no less than 3% of the on-site workforce will be minority employees and that no less than 7% of the on-site workforce will be female employees. Further, it is the goal of the FIRM if the PROJECT is of a construction nature that in all on-site employment generated that no less than 3% of the work hours generated shall be worked by minority employees and that no less than 7% of the work hours generated shall be worked by female employees.
- G) Subcontractors:** The FIRM will for all its PROJECT subcontractors regardless of tier (unless exempted by law and regulation) that received in excess of \$2,500 require that: (1) the subcontractor shall execute an “EEO Statement and Certification” similar in nature to this “Statement and Certification”, (2) said documentation to be maintained on file with the FIRM or subcontractor as may be appropriate.

Executed this _____ day of _____, 20__ by:

Printed name and title

Signature

NOTE: In addition to the various remedies prescribed for violation of Equal Opportunity Laws, the penalty for false statements is prescribed in 18 U.S.C. 1001.

NOTICE TO ALL BIDDERS

To report bid rigging activities call:

1-800-424-9071

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

**The Burnham
Historic St. Louis County Jail
Duluth, Minnesota**

PROJECT MANUAL

100% Construction Documents

January 10, 2020

Cover reissued Addendum No. 1 July 12, 2021

Owner:

New Burnham LLC

575 9th Street Southeast, Unit 215

Minneapolis, Minnesota 55401

LHB PROJECT NUMBER 180039



PERFORMANCE
DRIVEN DESIGN.

701 Washington Avenue North, Suite 200

Minneapolis, Minnesota 55401

Phone: (612) 338-2029

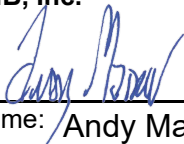
Contact: Andy Madson

**SECTION 00 0105
CERTIFICATIONS PAGE**

PROJECT: St. Louis County Jail Conversion to Housing
Duluth, Minnesota

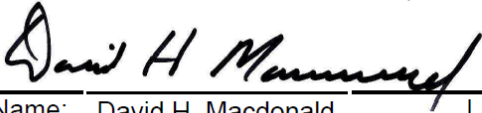
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and I am a duly licensed Architect, Landscape Architect or Engineer under the laws of the state of Minnesota.

**ARCHITECT OF RECORD
LHB, Inc.**


Name: Andy Madson License No. 50555

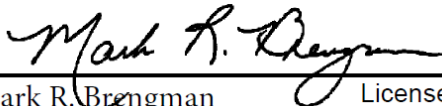
Date: January 10, 2020

**STRUCTURAL ENGINEER
MATTSON MACDONALD YOUNG, INC.**


Name: David H. Macdonald License No. 14751

Date: January 10, 2020

**MECHANICAL ENGINEER
STEEN ENGINEERING, INC.**


Name: Mark R. Brengman License No. 24713

Date: January 10, 2020

**ELECTRICAL ENGINEER
STEEN ENGINEERING, INC.**


Name: Jacob Melbostad License No. 56200

Date: January 10, 2020

Mechanical and
Electrical Engineer
signatures are obsolete.

Divisions 21 - 26
removed via Addendum
No. 1

**CIVIL ENGINEER
LHB, INC.**

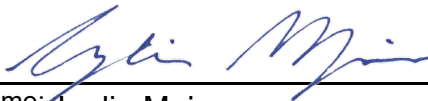


Name: Daniel G. Shaw

License No. 41423

Date: January 10, 2020

**LANDSCAPE ARCHITECT
LHB, INC.**



Name: Lydia Major

License No. 46911

Date: January 10, 2020

END OF SECTION

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| | - AIA Document A101 – 2017 Standard Form of Agreement Between Owner and Contractor |
| 00 6100 | Bond Forms |
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| | - AIA Document A201 – 2017 General Conditions of the Contract for Construction |
| 00 7300 | Supplementary Conditions |
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32 9223 Sodding

32 9300 Plants

DIVISION 33 – UTILITIES – NOT USED

END OF SECTION

SECTION 00 3100
AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 REPORTS

- A. The following reports are incorporated for reference only:
 - 1. "Hazardous Material Survey Former St. Louis County Jail" prepared by AMI Consulting Engineers P.A. dated April 19, 2018.
 - 2. "Historic Preservation Certification Application Part 2 - Description of Rehabilitation"

1.02 EXPLORATIONS, REPORTS, AND DOCUMENTS

- A. The explorations, reports, and documents referenced by this section are not part of the contract documents. The information represented by these explorations, reports, and documents was considered by architect for project design purposes. The owner and architect do not imply that the information and tests contained therein are necessarily representative, exhaustive, or comprehensive and expressly disclaim any warranties as to their accuracy or reliability for bidder's purposes or purposes of construction. The bidder may use this information and the data bidder judges appropriate, but bidder is not entitled to rely on any of the information, technical data, non-technical data, interpretations, or opinions contained therein or the completeness thereof. Bidder's reliance on such for bidder's purpose is solely at bidder's own risk.

1.03 EXISTING STRUCTURE

- A. All existing above ground structures at the site may not be shown on the Drawings and Bidder shall be responsible to verify the existence and location of all above ground structures. Bidder's Bid shall include the costs necessary for the performance, progress, furnishing, and installing of the Work as relates to existing above ground structures.

1.04 UNDERGROUND FACILITIES AND UTILITIES

- A. The known utilities located within the areas requiring excavation for the project are as shown on the Drawings.
- B. The Owner and Architect have no reliable information regarding the existence of subsurface structures at or contiguous to the Site other than those indicated in the Drawings. If the Bidder suspects or verifies the existence of subsurface structures which may affect the cost, performance, progress, furnishing, or installing of the Work in accordance with the Contract Documents prior to the time for the opening of bids, the Bidder shall notify the Owner and Architect promptly, in writing, of the conflict. If such an existing subsurface structure is located at any time thereafter, Owner and Architect will consider the existing subsurface structure under the provisions for differing conditions.

END OF SECTION 00 3100

HAZARDOUS MATERIALS SURVEY

Former St. Louis County Jail
521 West 2nd Street Duluth, MN

AMI Project Number 181019

April 19, 2018

Prepared for:

Mr. Joshua MacInnes
City of Duluth
411 West 1st Street
Duluth, MN 55806

Prepared by:



91 Main Street
Superior, WI 54880
PH: (715) 718-2193 / FAX (877) 761-7058



INTRODUCTION

AMI Consulting Engineers (AMI) was retained by the City of Duluth to perform a hazardous materials survey of the former St. Louis County Jail property located at 521 West 2nd Street, Duluth MN 55802 (Site). The Site is occupied by one vacant building. The proposed plans contemplated for the Site include redevelopment into apartments or other similar multi-family dwelling. The work performed as part of this project was completed to meet the following objectives:

1. Inventory potentially hazardous materials that should be removed and properly disposed prior to initiating demolition activities
2. Comment on the condition of lead paint in the building, previously inspected as documented in the December 2008 report by MacNeil Environmental, Inc.
3. Comment on the condition of asbestos in the building, previously inspected as documented in the December 2008 report by MacNeil Environmental, Inc.

The building was constructed in 1923 and then continuously updated through the years and is roughly 34,500 square feet in size (5 floors + basement, approximately 6,000 square feet building footprint). The exterior of the building consists stone walls, with an asphalt roof. The roof of the building is believed to be sealed with an asphalt sealant with aggregate and a steel flashing around the edges of the roof.

AMI performed the hazardous materials survey on March 26th, 2018. Typical interior wall finishes included plaster, sheetrock, cinder block and steel. Floor finishes appeared to be a combination of stone, cement and steel. Ceiling finishes included painted steel, plaster, sheetrock and drop-down ceilings. The building was vacant at the time of inspection. Photos identifying survey findings are included in **Appendix A**. A copy of AMI's hazardous material checklist is included in **Appendix B**.

SURVEY FINDINGS

Asbestos Containing Materials

An asbestos survey report, dated July 23, 2008, was conducted by MacNeil Environmental, Inc. The following materials were identified during that survey.

- 5,137 linear feet of pipe insulation
- 330 fittings
- 130 square feet of insulation
- 7,050 square feet of flooring
- A total of 9 "Containment" areas were defined: Containment A-I



During AMI's inspection of the building, AMI inspected the materials noted above. At the time of the survey it appeared that much of the asbestos noted in the survey was removed or in the process of being removed from the building.

Based on available information, it appears the following quantities of asbestos-containing items were not removed and still exist on site:

| Containment Letter ID ¹ | Containment Description ¹ | Pipe Insulation (Liner Feet) ¹ | Fittings (# fittings) ¹ | floor tile and mastic (square feet) ¹ | window caulk (unknown units) ¹ |
|------------------------------------|--|---|------------------------------------|--|---|
| B | Garage | 22 | 5 | | |
| C | Elevator Room, Freezer Room (sub-basement) | 325 | 75 | | |
| D | 1st Floor | | | 600 | |
| I | Outside | | | | ??? |
| | | | | | |

¹ = amounts in table are from "Specifications for Asbestos Abatement" dated July 23, 2008.

Lead Containing Materials

A lead inspection using an X-Ray Fluorescence Analyzer (XRF) was conducted on the property by MacNeil Environmental, Inc., which is documented in a report dated December 2008. During the inspection, lead paint was found throughout the property and it is believed no lead paint removal occurred since the 2008 report and those quantities noted in the report are believed to remain. AMI inspected the lead paint identified during the 2008 lead inspection. AMI found lead paint remaining in the property to be in deteriorated shape.

PCB Containing Materials

AMI observed numerous fluorescent light units throughout the property on the 1st floor and the basement. Most PCB-containing ballast had been removed. However, AMI noted some PCB-containing ballast in the stairwell on the 1st floor along with rooms on the first floor.

Mercury Containing Materials

Six of what AMI believes to be mercury containing fixtures were identified. Thermostats were present in the service lanes located between cell blocks on the 2nd, 3rd, and 4th floor.



Chlorofluorocarbons Containing Materials

On the first floor, there is one window-mounted air conditioning and a ceiling-mounted air conditioner. In the basement, AMI identified a walk-in cooler, a chest freezer, and what is believed to be a discarded refrigerant pump. On the first floor, AMI discovered an upright refrigerator, a chemical fire suppression system, and a portable fire extinguisher.

Potentially Hazardous Materials

A visual inspection for miscellaneous regulated waste materials that require separate handling and disposal was also performed. The following is a list of these documented items:

- Car Battery – Qty 1
- Pigeon feces, dead pigeons
- Assorted motor oil - Qty 6 quarts
- 30-gallon drum (Contents unknown) - Qty 1
- Gas Can (contents unknown) - Qty ½ gallon
- PVC glue - Qty 6 eight-fluid-ounce containers
- PVC primer - Qty 1 eight-fluid-ounce container
- Paint thinner - Qty 1 gallon
- Wall mounted electric fans - Qty 3
- Assorted caulking - Qty 7 eleven-ounce tubes
- Latex paint - Qty 1 gallon
- 40-Watt light bulbs
- Air compressor pumps - Qty 3
- Spray paint - Qty 2 cans

Major water damage was noted in the property. All levels of the building contained standing water in the form of ice due to the weather. There was also mold noted in the building, most likely due to water entering the building.

Underground/Aboveground Storage Tanks

No fuel storage tanks were observed on the property. Three air compressor tanks were located in the basement of the building. A newer natural gas furnace is located on the 1st floor of the property.

Electronics

No electronics of note were found in the property at the time of the inspection.



Limitations

In any building, the potential exists for hazardous building materials to exist inside of walls, above ceilings, under floors, and other inaccessible areas. AMI cannot be held responsible for any such hidden materials. In the case of the building demolition all contractors involved should be made aware of possible hidden hazardous materials, and it will be the responsibility of the contractor to take necessary precautions to ensure safety of their employees. If suspect material is found during the demolition process, they should be sampled prior to removal.

Recommendations

The following recommendations are provided based on the results of this hazardous materials inventory:

1. Non-friable Category I asbestos was identified during the asbestos inspection of the former St. Louis County Jail. The asbestos removal will be a regulated asbestos removal project. AMI recommends that a licensed asbestos abatement contractor certified by the Minnesota Department of Health remove all identified and assumed Category I non-friable asbestos-containing material (ACM) prior to initiating building demolition or remodeling. If left in place, Category I non-friable ACM must be segregated and disposed of as asbestos containing waste during demolition or remodeling. Any unidentified suspect ACM that may be encountered during demolition activities should be assumed to contain asbestos until they are sampled and analyzed. ACM can be disposed at SKB Shamrock Environmental Landfill located at 761 MN Highway 45, Cloquet, MN 55720 (non-friable only), or at Vonco V Services located at 1100 W Gary St, Duluth, MN 55808 (friable and non-friable) with advance appointment. Other hazardous material can be disposed of at WLSSD through their Clean Shop Program located at 2626 Courtland St., Duluth, MN 55806 by appointment only.
2. Lead paint was identified during a previous inspection. Lead paint removal will be a regulated lead removal project. All loose lead paint should be scraped and removed as per MDH guidelines. This work should be completed by a certified lead abatement contractor. Suspect lead paint not initially noted during the previous inspection should be assumed to contain lead until they are sampled and analyzed. Lead paint can be disposed at SKB Shamrock Environmental Landfill located at 761 MN Highway 45, Cloquet, MN 55720, or at Vonco V Services located at 1100 W Gary St, Duluth, MN 55808 with advance appointment
3. All hazardous equipment, hazardous substances and/or petroleum products should be removed and properly disposed of prior to building demolition or remodeling.



4. AMI recommends that all PCB ballasts located in the light fixtures be removed by a licensed contractor prior to demolition. PCB ballasts can be disposed of at WLSSD through their Clean Shop Program located at 2626 Courtland St., Duluth, MN 55806 by appointment only.
5. Dead pigeons and pigeon feces can be hazardous to human health if not properly handled. AMI recommends that a certified professional with the correct training and equipment be used to clean the affected areas before any other work starts in the building.

Standard of Care and Qualifications

Services performed by AMI have been conducted in accordance with generally recognized industry standards and current MPCA and MDH guidelines, where applicable. The services performed by AMI have been conducted with the level of care and skill ordinarily exercised by reputable members of the profession, practicing in the same locality under similar budget and time constraints. No other warranty is made or intended.

Prepared By:

Jordan Vargas

Environmental Professional

Reviewed By:

Kurt Carlson

Assistant Environmental Department Manager

APPENDIX A

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Peeling Paint Basement Ceiling



30 Gallon Drum/ Gas Can



Various Motor Oil



PVC Primer and Glue/Spray Paint



Chest Freezer/ Paint Thinner



Air Compressor



Walk-In Cooler



Discarded Refrigerant Pump



Ceiling Mounted Air Conditioner



Chemical Fire Suppression System



PCB Containing Lights



Window Mounted Air Conditioner



Portable Fire Extinguisher



Mold



Wall Mounted Fans



Presumed Mercury Thermometer



Dead Pigeons/Feces



Standing Water

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APPENDIX B

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Pre Demolition Checklist

Field copy

| | |
|----------------------------|----------------------------------|
| Client Name: | Joshua MacInnes / City of Duluth |
| Site Name: | Former St. Louis County Jail |
| Project Number: | 181019 |
| Site Address (Complete): | 521 W 2nd St Duluth, MN |
| Date of Site Visit: | 3/26/18 |
| Site Contact Name: | Josh MacInnes |
| Site Contact Phone Number: | 317-697-1866 |
| Site Visit Performed by: | Jordan Vargas, AMI |
| Weather: | Cloudy / Snowy |
| Areas Not Accessible: | |

Pre Demolition Checklist

Field copy

Asbestos

Asbestos is a naturally occurring mineral that separates into strong, very fine fibers. These fibers float in the air and are easily breathed into the lungs, causing serious health problems. Asbestos is not combustible, has high tensile strength, has good thermal and electrical insulating properties, is moderately resistant to chemicals, and has good frictional properties. It is durable, flexible, strong and resistant to wear. Thus, asbestos has been used for thousands of commercial and public applications including many types of building materials, products and insulation. A person cannot tell whether a material contains asbestos simply by looking at it, unless it is labeled. **Therefore, asbestos presence or absence must be confirmed by professional sampling and laboratory analysis. AMI did or did not collect samples of suspect ACM during this assessment.**

The following materials were identified as asbestos containing:

- Boiler rooms:
- Boilers, Furnaces, Fireplaces, and their components:
- Cement sheets near heating equipment:
- Boiler insulation:
- HVAC Duct insulation:
- Ductwork flexible fabric connections:
- Fireproofing materials:
- Fire doors:

Flooring:

- Vinyl floor tile:
- Vinyl sheet flooring:
- Asphalt tile:
- Linoleum paper backing:
- Flooring mastic (floor tile, carpet, etc.):

Electrical:

- Electrical panels:
- Electrical wiring insulation:
- Heating and electrical ducts/conduit:

Pipe and other insulation:

- Aircell (corrugated cardboard):
- Millboard:
- Preform:
- Joint compound:
- Spray applied insulation:
- Blown-in insulation:

Surfacing materials:

- Acoustical plaster:
- Decorative plaster:
- Textured paints coatings:
- Spray applied materials (acoustical, decorative, or insulative):

Roofing:

- Roofing shingles:
- Roofing felt:
- Base Flashing:

Pre Demolition Checklist

Field copy

| <i>Asbestos</i> | |
|-------------------------------------|---|
| <input type="checkbox"/> | Roof Tar: |
| <input type="checkbox"/> | Roof Penetrations: |
| Cement materials (Transite): | |
| <input type="checkbox"/> | Cement pipes (flues & vent pipes) |
| <input type="checkbox"/> | Cement Wallboard: |
| <input type="checkbox"/> | Cement siding: |
| <input type="checkbox"/> | Pegboard: |
| Ceiling materials: | |
| <input type="checkbox"/> | Ceiling tiles: |
| <input type="checkbox"/> | Ceiling tile adhesives (pucks): |
| <input type="checkbox"/> | Lay in ceiling panels: |
| <input type="checkbox"/> | Acoustical tiles: |
| Miscellaneous: | |
| <input type="checkbox"/> | Taping, joint, and spackling compound: |
| <input type="checkbox"/> | Caulking/putties: |
| <input type="checkbox"/> | Fire curtains and blankets: |
| <input type="checkbox"/> | Laboratory hoods, table tops, gloves, etc.: |
| <input type="checkbox"/> | Gaskets: |
| <input type="checkbox"/> | Light fixture heat shields: |

Pre Demolition Checklist

Field copy

| ID # | Suspected ACM Description | Location | Approximate Quantity | Condition | Result |
|------|---------------------------|----------|----------------------|-----------|--------|
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Pre Demolition Checklist

Field copy

| <i>Mercury</i> | |
|--|--|
| <p>Mercury is a heavy, shiny, silvery-white poisonous metal that is a liquid at room temperature. Mercury can be found in thermometers, barometers, thermostats, dental offices, blood-pressure devices, and fluorescent and other types of light bulbs. Liquid mercury evaporates at room temperature and gives off harmful, invisible, odorless vapors. Breathing these vapors causes the most harm to people, but mercury can also be harmful when swallowed or when it contacts broken skin. Mercury is quite toxic: it causes birth defects and works its way into the food chain. Women and children are most at risk from mercury poisoning, which can cause brain and nerve damage resulting in impaired coordination, blurred vision, tremors, irritability and memory loss. Mercury is a fast-moving liquid that spreads quickly. Prompt containment and control of both the liquid and its vapors is very important. In general, do not remove the mercury from a device such as a switch. Keep the product intact and remove and store in a covered container in a manner that will prevent breakage, spillage, or release. Label and store the mercury containing devices to ensure proper handling and disposal.</p> | |
| <input type="checkbox"/> | Sink Traps in Schools or locations that used free mercury or thermometers |
| <input type="checkbox"/> | Hospital Devices/Equipment |
| Batteries: | |
| <input type="checkbox"/> | Smoke Detectors: |
| <input type="checkbox"/> | Emergency Lighting Systems: |
| <input type="checkbox"/> | Elevator Control Panels: |
| <input type="checkbox"/> | Exit Signs: |
| <input type="checkbox"/> | Security systems and Alarms: |
| Lighting: | |
| <input type="checkbox"/> | Fluorescent Lights: |
| <input type="checkbox"/> | High Intensity Discharge: |
| <input type="checkbox"/> | Metal Halide: |
| <input type="checkbox"/> | High Pressure Sodium: |
| <input type="checkbox"/> | Mercury Vapor: |
| <input type="checkbox"/> | Neon: |
| <input type="checkbox"/> | Switches for lighting using mercury relays: look for any control associated with exterior or automated lighting systems: |
| <input type="checkbox"/> | "Silent" Wall Switches: |
| Heating, Ventilating, and Air Conditioning Systems: | |
| <input checked="" type="checkbox"/> | Thermostats: |
| <input type="checkbox"/> | Aquastats: |
| <input type="checkbox"/> | Pressurestats: |
| <input type="checkbox"/> | Firestats: |
| <input type="checkbox"/> | Manometers: |
| <input checked="" type="checkbox"/> | Thermometers: |
| Boilers, Furnaces, Heaters & Tanks: | |
| <input type="checkbox"/> | Mercury Flame Sensors by pilot lights: |
| <input type="checkbox"/> | Manometers, Thermometers, Gauges: |
| <input type="checkbox"/> | Pressure-trol: |
| <input type="checkbox"/> | Float or Level Controls: |
| <input type="checkbox"/> | Space Heater Controls: |
| Electrical Systems: | |
| <input type="checkbox"/> | Load Meters and Supply Relays: |

Pre Demolition Checklist

Field copy

| <i>Mercury</i> | |
|---|---|
| <input type="checkbox"/> | Phase Splitters: |
| <input type="checkbox"/> | Microwave Relays: |
| <input type="checkbox"/> | Mercury Displacement Relays: |
| Other Industrial Equipment and Areas of Mercury Concern: | |
| <input type="checkbox"/> | Any control used for measurement of vacuum, pressure, fluid level, temperature, or flowrate |
| <input type="checkbox"/> | Other switches may have been used in old clocks, water cleaning systems, pneumatic control switches, and other areas: |

| ID # | Suspected Mercury Description | Location | Approximate Quantity | Condition | Result |
|------|-------------------------------|----------|----------------------|-----------|--------|
| | Pressure Temp | Bm | 6 | Good | |
| | Thermometers | 2, 3, 4 | 6 | Mod | |
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Poly-Chlorinated Biphenyl's (PCBs)

PCBs are a family of chlorinated compounds that were dielectric or especially non-conductive. PCBs are oily liquids that are usually pale yellow to clear. PCBs are a family of chemicals manufactured and used in the United States until the late 1970's, which were mostly used in electrical devices like capacitors, transformers and lighting ballasts to protect their oils from breaking down at high temperatures. These substances are strictly regulated because of their toxicity and persistence in the environment. PCBs continue to be a major source of fish contamination, leading to fish consumption advisories for people. Management of PCBs is based on their concentration in an item. Materials with PCB concentrations of 50 parts per million (PPM) or greater are regulated by the U.S. EPA under the Toxic Substances Control Act.

| | |
|-------------------------------------|--|
| <input type="checkbox"/> | Sumps or Oil traps (industrial facilities): |
| <input type="checkbox"/> | Transformers: |
| <input type="checkbox"/> | Transistors: |
| <input type="checkbox"/> | Capacitors (old appliances, electronic equipment): |
| <input type="checkbox"/> | Heat Transfer Equipment: |
| <input checked="" type="checkbox"/> | Light Ballasts: |

| ID # | Suspected PCB Description | Location | Approximate Quantity | Condition | Result |
|------|---------------------------|----------|----------------------|-----------|--------|
| | Light Ballast | 1st | 12 | Good | |
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Pre Demolition Checklist

Field copy

Lead

Lead and lead based paint (LPB) are common items in many older buildings. The use of LPB was discontinued in 1978, however, many buildings have multiple layers of paint and should be examined carefully. The Minnesota Pollution Control Agency (MPCA), Minnesota Department of Health (MDH), and the U.S. Environmental Protection Agency (EPA) considers paint having a concentration of 1.0 milligram per square centimeter (mg/cm^2) or more or 0.5% by material weight, as determined by XRF analysis, as lead-based paint. The U.S. Occupational Safety and Health Administration (OSHA) Lead in Construction Standard 29 CFR 1926.62 applies to all situations where employees are engaged in the disturbance of lead-containing coatings, regardless of the quantity of lead. Lead based paint adhered to the substrate may be disposed as general demolition debris. If lead paint, as determined by an XRF reading of greater than 1.0 mg/cm^2 or 0.5% by weight is observed to be peeling or in poor condition or any paint that is not attached to the substrate must be removed and disposed as lead waste in accordance with state and federal regulations. The renovation or demolition likely involves disturbing paint which contains lead at any concentration. The OSHA lead standard requires workers to be protected whenever lead coatings are present. Care should be taken while removing lead paint surfaces so as to not create dust. Contractors should be informed of the presence of lead paint and should comply with the OSHA lead standard.

Lead can be found in the following areas:

| | |
|--------------------------|--|
| <input type="checkbox"/> | Lead Based Paint: |
| <input type="checkbox"/> | Lead-Acid Batteries: (lighting, exit signs, security systems): |
| <input type="checkbox"/> | Lead flashing molds and roof vents: |
| <input type="checkbox"/> | Lead Pipes and solder: |

| ID # | Suspected Lead Description | Location | Approximate Quantity | Condition | Result |
|------|----------------------------|------------------|----------------------|-----------|--------|
| | Lead Paint | D, 1, 2, 3, 4, 5 | N/A | Poor | |
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Pre Demolition Checklist

Field copy

| Chlorofluorocarbons | |
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| CFCs (chlorofluorocarbons) and HCFCs (hydrochlorofluorocarbons) are man-made refrigerants that destroy the ozone layer. Federal laws also prohibit releases and also require recovery of these substances, as well as other refrigerants that are global warming gases or pose other health or environmental problems. They must be properly recovered, using approved equipment operated by qualified technicians. The entity recovering these refrigerants must be registered with the DNR and supply documentation to whomever receives the scrapped equipment that the refrigerants were properly removed. | |
| <input checked="" type="checkbox"/> | Fire Extinguishers (both portable and installed halon suppression systems): |
| <input checked="" type="checkbox"/> | Air Conditioners (rooftop, room, and central): |
| <input checked="" type="checkbox"/> | Walk in Coolers (refrigeration or cold storage areas) |
| <input type="checkbox"/> | Water Fountains and Dehumidifiers: |
| <input checked="" type="checkbox"/> | Refrigerators/Freezers/Chillers: |
| <input type="checkbox"/> | Heat Pumps: |
| <input type="checkbox"/> | Halon Containing Fire Extinguishers |
| <input type="checkbox"/> | Vending Machines/Food Display Cases: |
| <input checked="" type="checkbox"/> | Miscellaneous Refrigerants: |

| ID # | Suspected CFCs Description | Location | Approximate Quantity | Condition | Result |
|------|----------------------------|--------------|----------------------|-----------|--------|
| | Freezer | Basement ent | 1 | Good | |
| | Walk in cooler | Basement | 1 | Good | |
| | Discardal Pump | Basement | 1 | Poor | |
| | Fridge | 1st/Remodl | 1 | Good | |
| | Air conditioner | 1st | 1 | Good | |
| | Hanging Air condense | 1st | 1 | Good | |
| | Fire Suppression | 1st Wk2 | 1 | Good | |
| | Portable fire extinguish | 1st | 1 | Good | |
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Pre Demolition Checklist

Field copy

| OTHER | |
|-------------------------------------|---|
| <input checked="" type="checkbox"/> | Solid Waste (all non-building components such as files, books, trash, desks, chairs, etc.) must be removed prior to demolition. |
| <input type="checkbox"/> | Pesticides or Fertilizers: must be properly handled and disposed of prior to demolition. |
| <input type="checkbox"/> | Open Burning: It is illegal to burn unwanted buildings in most states. Most state laws prohibit the burning of painted, treated or unclean wood, asphalt, plastics of any kind, oily substances, tires and other rubber products, wet rubbish and other materials. In the case of building demolition, that would include roofing materials, all kinds of flooring materials, insulation, plywood and other composition board, electrical wiring, cabinetry and countertops, and plastic plumbing. |
| <input checked="" type="checkbox"/> | Hazardous Waste: (all HW including household HW) must be properly handled and disposed of prior to demolition. |
| <input type="checkbox"/> | Appliances: May contain ozone-depleting or other regulated refrigerants; PCB-containing capacitors or ballasts; or mercury; and must be processed by an appliance demanufacturer. |
| <input type="checkbox"/> | Well Abandonment: Unused and improperly abandoned wells are a significant threat to groundwater quality. If not properly filled, abandoned wells can directly channel contaminated surface or soil water into groundwater. State laws typically require that any wells or boreholes be properly filled prior to any demolition or construction work on the property. |
| <input checked="" type="checkbox"/> | Electronics: Computers, stereo equipment, circuit boards, etc. May contain hazardous materials such as lead, cadmium, chromium, and mercury and may be regulated as hazardous wastes if not recycled. |
| <input checked="" type="checkbox"/> | Oil: (used oil, hydraulic oils in door closers, elevator shafts, etc) must be collected and properly disposed of prior to demolition. |
| <input type="checkbox"/> | Soil Contamination: Visual indications or documented soil contamination at the site. |
| <input type="checkbox"/> | Exit Signs: Many self-luminous exit signs contain significant amounts of radioactive tritium. All self-luminous exit signs are required to have a permanent label affixed to the sign that identifies it as containing radioactive material. In addition, the label will include the name of the manufacturer, the product model number, the serial number, and the quantity of tritium contained. It is illegal to abandon or dispose of these signs except by transferring them to the manufacturer or others licensed by the U.S. Nuclear Regulatory Commission to accept them. |
| <input type="checkbox"/> | Tanks: visual indications of former heating tanks or storage tanks exists. |

Pre Demolition Checklist

Field copy

| ID # | Suspected Other Description | Location | Approximate Quantity | Condition | Result |
|------|-------------------------------------|----------|----------------------|-----------|--------|
| | Car Battery | 1st | 1 | Good | |
| | Pigeons / feces | 4th | A lot | Poor | |
| | Assorted Oil | B/1st | 6 gts | Good | |
| | 30 gal drum | B | Unknown | | |
| | PVC Glue | B/1st | 6 containers | Good | |
| | PVC Primer | B | 1 container | Good | |
| | Paint thinner | B | 1 gal | Good | |
| | 2 Elec Fans | 1st | 2 | Mod | |
| | Assorted Caulking | B/1st | 7 tubes | Good | |
| | Latex Paint | 1st | 1 gal can | Good | |
| | Various 40 W Aircompressor Pumps | B/1st | 3 | Good | |
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HISTORIC PRESERVATION CERTIFICATION APPLICATION
PART 2 – DESCRIPTION OF REHABILITATION

| | | |
|------------------|---|----------------------------------|
| Property name | <u>St. Louis County Jail</u> | NPS Project Number <u>39,526</u> |
| Property address | <u>521 West Second Street, Duluth, MN 55802</u> | |

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7. **CONSTRUCTION DOCUMENTS** – Drawings
 - St. Louis County Jail – Conversion to Housing (LHB, dated 6/21/2019)
8. **OTHER** – Preliminary Consultation
 - Request for preliminary consultation (PVN, dated 4/23/2018)

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9. OTHER – Reuse Studies

- Study for Feasibility of Conversion of Old St. Louis County Jail to Office Space (Stanius Johnson Architects, Inc, dated September 1994)
- Saint Louis County Jail Reuse Study (Minnesota Consultation Team and Thomas R. Zahn & Associates, dated Summer 1999)
- Historic Jail Adaptive Reuse: Duluth, MN (Blue Limit LLC, dated 2013)

10. OTHER – Window Shop Drawings

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1. NARRATIVE
Part 2

**HISTORIC PRESERVATION CERTIFICATION APPLICATION
PART 2 – DESCRIPTION OF REHABILITATION**

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5. Detailed Description of rehabilitation work

| |
|-----------------|
| Number 1 |
|-----------------|

Feature Site Date of Feature 1924, 1980, 2011

Describe existing feature and its condition

The St. Louis County Jail is a rectangular, five-story, Neo-classical Revival building that was constructed in 1924. There is 1980 one-story addition against the west façade of the building. The addition is at grade on the southeast side and below grade on northwest side. The building is bounded by Mesaba Avenue on the northwest and West Second Street on the south and east. The surrounding area to the north and northwest is primarily a residential neighborhood. The building's setbacks from West Second Street are consistent with the configuration of the other buildings in the Duluth Civic Center Historic District, including the Saint Louis County Courthouse, Duluth City Hall, and Federal Building – U.S Courthouse and Custom House. This area of Duluth is built into a hillside which rises to the north and northwest sides, causing a grade change along the north and south façades of the building.

The landscaping generally includes: grass lawn areas in front of the north and south façades; concrete paved sidewalks along West Second Street; paved parking spaces in front of the east façade and to the south of the addition; granite short walls at the front yard along West Second Street; a set of granite steps and walkway pavers in front of the primary entrance; a granite stair leading to a concrete alley along the north façade; concrete retaining walls along Mesaba Avenue, parallel to the north façade and along West Second Street; and trees on the north hill. There is an area well at the west façade under the addition.

The site is generally in fair condition. The granite short walls appear to be in good condition. **The granite stair is in fair condition with cracked steps and missing mortar joints. Some granite walkway pavers at the front of the primary entrance have settled.** Concrete retaining walls are in fair condition with cracking. The concrete pavement is typically in fair condition with cracking, differential settlement, and surface deterioration, and poor condition at the alley along the north façade with severe cracking and differential settlement. Cracking in the asphalt layer of the parking spaces is typical.

Photo numbers E.01-E.08, E.12, E.15-E.18, E.25, H.01-H.06 Drawing numbers C100, L100, L101, D1.00, A0.10, E0.01

Describe work and impact on feature

The non-historic one-story addition will be removed to restore the historic setting of the site and provide parking for the proposed residential use. The northwest concrete wall of the addition will remain and act as a retaining wall. The retaining wall will be stabilized with soil nailing reinforcement to counteract the lateral earth pressure (pending structural investigations). The existing parking lot will be re-paved to provide a more efficient parking layout. One new concrete driveway will be created at the west parking area. Concrete retaining walls will remain as is. The existing concrete sidewalks will mostly remain and be repaired (see Item #12). The concrete sidewalk along the west granite short wall will be removed to build a concrete ramp providing code-required accessibility to the building. Portions of the existing concrete sidewalk and the existing curb cut will be removed to accommodate the new concrete driveway and curb cut. **A 6-**

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foot-wide portion of the west granite short wall will be removed for the installation of a concrete walkway providing code-required accessibility to the front yard. The granite stair, steps, and walkway pavers will remain and be repaired. Small cracks will be infilled with stone restoration mortars. Deteriorated beyond repair granite pieces will be replaced with granite cladding salvaged from the demolition of the 1980 addition. The area well at the west side will be backfilled.

New landscaping will include turf at the east portion of the front yard, shrubs along the short granite walls to provide some privacy to the front yard, a patio paved with granite salvaged from the demolition of the 1980 addition, exterior lighting (see Item #30), and trees aligned along West Second Street to restore the historic landscaping (see historic photos in attachment). A concrete pad will be installed at the east side of the building to accommodate a new transformer (see Item #30).

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| |
|-----------------|
| Number 2 |
|-----------------|

Feature Exterior Walls - Masonry Date of Feature 1924, 1980, 2011

Describe existing feature and its condition

The St. Louis County Jail is constructed of load-bearing exterior brick and clay tile walls finished with grey granite cladding. The addition is constructed of cast-in-place concrete walls clad with grey granite. Each façade of the 1924 building features a decorative granite roundel at each upper corner and a terra cotta cornice. The cornice consists of closely spaced modillions supporting a projecting roofline embellished with acroteria. The upper portion of the south façade's corners bears a sculptured cartouche or shield, above which is an animal head. The primary entrance of the 1924 building features a granite portico with an ornamental entablature. The 1980 addition features vertical granite panels protruding from the southeast façade.

Window openings on the 1924 building and 1980 addition feature granite sills. There is a metal fire escape on the north façade of the building (see Item #8).

The masonry is generally in good to fair condition with missing mortar joints, biological growth, graffiti, abandoned embedded metal hardware, and limited minor cracking. The granite window sills are in good condition. The terra cotta cornice appears to be in good condition.

S1.30 – S1.50, S3.00, D1.00,
D2.00, D2.01, A0.10, A2.00,

Photo numbers E.01-E.10, E.15-E.23, E.25 Drawing numbers A2.01, M2.00

Describe work and impact on feature

The walls of the 1980 addition will be mostly removed as part of the demolition of the addition (see Item #1). The terra cotta cornice, granite cladding, portico, ornamental features, and sills will remain. Stone rehabilitation will include limited spot repointing, crack infills, graffiti removal, and cleaning. Deteriorated or missing mortar joints will be repointed per *Preservation Brief 2: Repointing Mortar Joints in Historic Masonry Buildings*. Repointing mortar will match the color, texture, strength, joint width, and profile of the existing mortar joints. Graffiti will be removed by using removal techniques that will not damage the surface of the granite. Chalked graffiti will be removed with soft brushes or by poulticing with water, organic solvents or alkali-based paint removers. Alkali-based bleaches may be used in a poultice to bleach or decolorize certain dyes contained in some painted graffiti. The base of the granite cladding will be cleaned using the gentlest means possible. Cleaning will follow guidance as provided in *Preservation Brief 1: Assessing Cleaning and Water-Repellant Treatments for Historic Masonry Buildings*.

The granite cladding of the 1924 building will be repaired at the junction with the 1980 addition. Holes in the granite will be patched with stone restoration mortars to match. Granite damaged beyond repair will be replaced with granite cladding salvaged from the demolition of the 1980 addition. Alternately, if technically not feasible, suitable substitute materials matching the existing granite in appearance, color, and texture will be used. The first-level south window opening at the west façade will be restored to its original size by infilling the base of the wall with salvaged granite or suitable substitute materials. Clay tile salvaged from the removal of interior partition

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walls will be reused to reconstruct the window opening at the interior (see Item #15). If not feasible, concrete masonry units will be used. At the interior face of exterior walls of the 1924 building, the brick and clay tile masonry will be locally removed at the second through fourth levels to create beam pockets supporting new steel channel beams (see Item #13 for more details).

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5. Detailed Description of rehabilitation work

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|-----------------|
| Number 3 |
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Feature Windows Date of Feature 1924, 1980, unknown

Describe existing feature and its condition

All window openings are historic. Each façade displays regular patterns of fenestration with evenly-spaced rectangular punched window openings. The majority of the windows were previously removed and the openings infilled with glass block. One basement window on the north façade appears to be historic, as it consists of a multi-divided lite steel window with wire glass and steel bars. Most non-historic windows feature an inner small metal vent, hopper-style aluminum window or one-by-one aluminum window, and have steel bars and an operable metal screen on the interior side. On the south façade, the four first-level window openings to the west of the primary entrance have an aluminum sliding window with glass block above. According to historic photographs, historic windows were casement style with divided lights and hopper-style transoms above. Basement windows have masonry window wells. The historic windows of the light well at the fourth level were removed when the fifth level was added (see Items #16 and #17). The historic steel frame and safety bars remain at some window openings of the light well and were removed and infilled with concrete masonry units (CMU) elsewhere. The first-level south window bay at the west façade was altered and converted to a door bay. The 1980 addition features metal sliding windows and steel lintels.

The historic window that remains at the basement is in poor condition with severe corrosion and non-historic alterations such as the installation of an inner vent. Non-historic windows are in fair condition with cracked and missing glass blocks, staining, missing sealing joints, surface deterioration and corrosion on the blades of the inner vents, staining at the inner aluminum windows, surface corrosion and peeling paint at the interior steel bars, and surface corrosion at the operable metal screens. The aluminum sliding windows are typically in good to fair condition with missing or deteriorated sealant joints. The metal windows and steel lintels of the addition are in fair condition with evidence of corrosion. Window wells appear to be in fair condition with miscellaneous debris accumulating at the bottom.

D1.00-D1.40, D2.00, D2.01,
A2.00, A1.40, A1.72, A1.73,
A1.74, A2.01, A2.32, A3.00,

Photo numbers E.01-E.08, E.19-E.24, H.01 Drawing numbers A5.30, A5.31

Describe work and impact on feature

The non-historic glass block, vents, aluminum windows, and metal screens will be removed. The historic basement window and interior steel bars throughout the building will be typically removed. Interior steel bars will remain at the south windows of the transverse corridors and the glass doors of the fire escape (see Item #8). Based on a historic photograph and in the absence of any other historical documentation, new painted aluminum windows matching the historic steel window configuration and assumed profiles will be installed and consist of simulated divided light casement windows with a fixed transom above. Code-required fall-prevention devices will be installed at the interior side of the windows. To reduce the amount of ductwork to be installed at

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the units to provide tempered air, interior window screens will be installed to reduce heat gain from sunlight. Basement level windows will be fixed and have simulated divided lights. Window wells will remain and the debris will be removed. At the fourth-level light well, window openings with CMU infills will mostly remain as is. Seven of these infilled window bays will be altered to provide access to the units and new stair shaft (see Items #22 and #28). The remaining steel window frames and safety bars at the fourth-level light well will be removed and infilled with CMU. On exterior walls, the existing exterior sealant will be carefully removed and new high-quality elastomeric sealant will be installed at the perimeter of each window opening.

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|-----------------|
| Number 4 |
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Primary Entrances – South and

Feature Southeast Façades Date of Feature 1924, 1980

Describe existing feature and its condition

There are two primary entrances at the first level of the building. The primary entrance on the south façade of the building is above grade and consists of historic double-leaf metal-paneled doors with a decorative metal transom above. The primary entrance located at the east end of the southeast façade of the addition features a non-historic hollow metal storefront door with a clear glass light and a side transom.

The historic metal door is in fair condition with staining, evidence of corrosion on the frame, and a missing west door leaf (stored on site). The non-historic metal door is in fair condition with evidence of corrosion and surface deterioration.

D1.00, D2.00, D2.01, A0.10,

Photo numbers E.01, E.02, E.07, E.10, E.13, E.18 Drawing numbers A1.00, A1.60, A2.00, A2.01, A5.30

Describe work and impact on feature

The historic metal door of the 1924 building will remain, be reused as a primary entrance, and be restored. The west door leaf stored on site will be re-installed. The two door leaves will be fixed in their open position. Surface corrosion will be removed from the doors and transom with a soft wire brush. A transparent rust-inhibitive product will be applied on the doors and frame. The historic hardware will remain. Historic doors will be fixed in their open position and the doorway will remain open.

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| Number 5 |
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Secondary Entrances – North, West,
Feature and Southeast Façades Date of Feature 1924, 1980

Describe existing feature and its condition

There is a secondary entrance located in the second eastern bay of the north façade. The secondary entrance provides access to the first-level kitchen and kitchen storage rooms. This service door appears to be historic and consists of a single-leaf metal door with a one-over-one wire glass light and divided wire glass transom and side lites. The non-historic addition features a secondary entrance flat slab metal door at the west end of the southeast façade.

The historic metal door is in poor condition with severe corrosion, distorted metal paneling, and a non-historic alteration (modern aluminum-framed glass lite). The non-historic metal door is in fair condition with missing paint, corrosion, and loose hardware.

D1.00, D2.00, D2.01, A0.10,
Photo numbers E.02, E.05, E.07, E.08, E.11, E.14 Drawing numbers A1.00, A2.00, A2.01, A5.30

Describe work and impact on feature

The service door at the 1924 building is deteriorated beyond repair and will be removed and replaced with a new custom metal-framed door matching the historic door and transom configuration with simulated divided lights. An accessible secondary entrance will be provided at the west façade of the 1924 building by reusing the existing doorway connecting the building to the 1980 addition. The non-historic interior door at the doorway will be removed and replaced with a new aluminum door with a glass lite (see also Item #28).

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|-----------------|
| Number 6 |
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Loading Entrance – Garage Door at

Feature East Façade Date of Feature Unknown

Describe existing feature and its condition

There is a non-historic metal overhead garage door with a non-historic divided wire glass transom in the center bay of the east façade that provides access to the lower level. The garage door opening is historic.

The non-historic metal door is in fair condition with distorted metal paneling, surface deterioration, and staining.

D1.00, D2.01, A0.10, A1.00,

Photo numbers E.03, E.12, E.15, H.01 Drawing numbers A2.01, A5.30, M2.00

Describe work and impact on feature

The non-historic garage door will be removed and replaced with a custom double-leaf metal door with recessed panels and simulated divided lights, matching the historic door configuration based on a historic photograph. The historic garage door appeared to be a metal-paneled accordion door with clear lights. A metal exhaust vent louver will be provided at the new garage door transom (see Item #29 for more details).

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5. Detailed Description of rehabilitation work

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|-----------------|
| Number 7 |
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Feature Signage Date of Feature 1924

Describe existing feature and its condition

Historic exterior building signage remains and includes: 1) the words “THIS BUILDING WAS ERECTED IN THE YEAR A.D. 1923 BY THE SAINT LOUIS COUNTY BOARD, AS A JAIL FOR THE SAFE KEEPING OF THE PRISONERS” carved in the metal transom above the primary entrance at the south façade; 2) “THE GREAT PRIVILEGE IS GIVEN TO ALL TO DEVELOP STRENGTH OF CHARACTER, TO LEAD CLEAN AND HONEST LIVES, TO RENDER DILIGENT AND WORTHY SERVICE, TO HELP OTHERS AND TO BE LOYAL CITIZENS OF THE REPUBLIC AND OBEDIENT TO ITS LAWS” carved in the terra cotta frieze along the south façade.

The historic metal signage is generally in fair condition and poor condition along the door opening with signs of corrosion. The historic terra cotta signage appears to be in good condition.

G0.02, D1.00, D2.00, A0.10,

Photo numbers E.01, E.02, E.08, E.10, H.01, H.03 Drawing numbers A2.00

Describe work and impact on feature

The historic terra cotta signage will remain as is. The historic metal signage will remain and be repaired (see Item #4). Per building use and standard code requirements, the rehabilitation work will also include the installation of exterior and interior signage. Exterior signage will be provided for the accessible parking stall and building entrances. Accessible building entry directional signage will be installed at two locations on the south short granite wall (see Item #1). A free-standing accessible parking stall signage will be installed at the front of the accessible parking stall at the west parking area. New metal signage reading “521 W. 2ND STREET” will be installed in the mortar joints of the north granite short wall along West Second Street. Interior signage will include: unit entrance and directions, elevator and stairs, community spaces, support spaces and mechanical rooms, room occupancy, emergency exit signage, and evacuation maps.

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|-----------------|
| Number 8 |
|-----------------|

Feature Fire Escape Date of Feature Unknown

Describe existing feature and its condition

There is a non-historic metal fire escape at the third eastern bay of the north façade that is connected to the second through fourth levels of the building. A small vestibule – historically a “server room” (see historical drawings) – provides access to the fire escape at the north end of the transverse central corridor (see Item #20). The second through fourth-level fire escape doors consist of double-leaf steel doors with two by three wire glass lite, divided transom, steel bars on the interior side, and appear to be historic. The fire escape is anchored to the exterior walls.

The metal fire escape is in fair condition with distorted landings, peeling paint, and surface corrosion. The steel doors leading to the fire escape are in fair to poor condition with evidence of corrosion and broken wire glass panes.

Photo numbers E.05, E.19 Drawing numbers D1.20, D1.40, D2.00, A0.10, A1.20, A1.40, A2.00, A5.30

Describe work and impact on feature

The fire escape will be removed. Anchor holes in the granite cladding will be patched with stone restoration mortars to match as close as possible. The second-through fourth-level steel doors and bars will remain and be repaired. Wire glass panes will be replaced with clear glass. Light rust, flaking and excessive paint will be removed with manual or mechanical abrasion techniques, such as a wire brush. At locations where medium to severe corrosion occurred, techniques such as chemical cleaning or sandblasting with low pressure (80-100 psf) with a grit size between #10-#45, and a pencil point blaster will be used. Doors will then be gently cleaned and primed with rust-inhibiting primer and repainted with two coats of finish paint (compatible with the primer). Doors will be fixed in closed position. The masonry surrounds will be caulked with a high-quality elastomeric sealant.

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|-----------------|
| Number 9 |
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Feature Roof – Roofing, Parapet, Drainage Date of Feature 1978, 1980, 2011

Describe existing feature and its condition

The building has a non-historic flat roof without parapet on all four sides. The roof construction is part of the 1978 fifth-level addition. The current roofing system is a modern replacement (2011) and consists of a low-slope rubber membrane. Roof edges feature non-historic metal coping. The current drainage system consists of non-historic internal rainwater leaders. The non-historic addition has a flat roof with concrete roof pavers over a rubber membrane. The short parapet walls on the northwest, southeast and southwest sides are covered with granite coping.

The roofing membrane of the building is in good to fair condition with evidence of former patch repairs and staining due to ponding water. The metal coping is in good condition. The condition of the roofing system of the addition could not be assessed as it was concealed by the concrete roof pavers. The concrete pavers are in fair condition with loose and cracked pavers, debris, and biological growth. The granite coping is in good condition.

S1.60, S4.00, A1.40, A1.50,

Photo numbers E.25-E.30 Drawing numbers A2.32, A3.00

Describe work and impact on feature

At the 1924 building, the roofing membrane, metal coping, and drainage system will remain as is. Six 2 by 4 foot structural openings will be made in the non-historic pre-cast concrete roof planks to install skylights. The metal-framed skylights will provide natural daylight to the fourth-level light well (see also Item #16). The skylights will protrude up to 16 in above the roof level. Steel angle headers will be anchored at each end of the structural openings. Short steel angles will be welded to the steel angle headers to provide support to the new skylights.

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Feature Roof – Penthouse, Access Date of Feature 1978

Describe existing feature and its condition

The roof is currently accessed through the metal rooftop door of the non-historic penthouse enclosing the primary vertical circulation core of the building (see Items #22 and #23). The penthouse protrudes above the roof level, is made of CMU, and is finished with painted brick veneer. The addition does not have a dedicated roof access.

The CMU is in fair condition with graffiti on the interior wall faces. The rooftop door is in fair condition with surface corrosion, and peeling and missing paint. The brick veneer is in fair condition with minor staining and abandoned embedded metal rods that are corroded.

E.01, E.02, E.05, E.25, E.26, E.29, D2.00, D2.01, A1.50, A2.00,

Photo numbers 5.17, 5.18 Drawing numbers A2.01, A3.01, A4.01

Describe work and impact on feature

The non-historic penthouse will remain as is. The interior face of the CMU walls will be painted.

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| Number 11 |
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Feature Roof - Mechanical Equipment Date of Feature N/A

Describe existing feature and its condition

The building does not currently have mechanical equipment on the roof.

Photo numbers E.26-E.28 Drawing numbers A1.40, M2.40

Describe work and impact on feature

To avoid strengthening the existing roof structure and having a rooftop unit that would be visible from Mesaba Avenue, a new make-up air mechanical unit will be installed in the east mechanical room at the fifth level to provide the building with tempered air. Mechanical roof penetrations will be created, including: boiler intake and exhaust vents, louvered outside vents, and water heater intakes and flues.

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Number 12

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| Feature <u>Structure</u> | Date of Feature | 1924, ca. 1976, 1978, 1980, various unknown |
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Describe existing feature and its condition

The building has historic load-bearing brick and clay tile exterior walls and clay tile interior walls. The basement level features stone walls, clay tile walls, and exposed round concrete columns. The CMU walls at the perimeter of the fifth level and at the penthouse level are not historic. The floors at the lower through fourth levels are historic and constructed of concrete, concrete over a steel-plated ceiling, or concrete over clay tile over a steel-plated ceiling. At the fifth level, there is a non-historic concrete slab poured over the historic steel-plated ceiling of the fourth level (see also Item #17). The third through fifth levels are supported by the steel framing of the cells and corridors (see Item #13). Historic steel beams are exposed at the second through fourth-level transverse corridors (see Item #20). The non-historic addition is constructed of cast-in-place concrete walls.

Generally, stone basement walls are painted and clay tile walls are plastered. There are mechanical chases in the perimeter walls at the first through fourth level that used to accommodate the former vertical steam piping system. Some first-level interior clay tile walls were removed likely ca. 1976. CMU walls are typically painted.

The concrete columns and stone and clay tile walls at the lower level are in fair condition with typical deterioration of the finishes (see Item #25). The brick and clay tile walls at the first through fourth levels are in fair condition with broken and missing masonry units. The CMU walls are generally in good condition and fair condition with peeling paint, dark staining, and graffiti. The steel beams at the transverse corridors are in fair to poor condition with corrosion and peeling paint. Floors are generally in good to fair condition (see Items #26 and #27).

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| L.09, L0.10, L.13, L.15-L.17, 1.01, 1.14, 1.15, 1.22, 1.23, 1.48-1.50, 2.05, 2.07, 2.20, 3.05, 3.06, 3.08, 3.09, 3.31, 4.05-4.07, 4.11, 4.12, 4.14, 4.15, 4.27, 4.28, 5.01, 5.04- | S1.10-S1.60, D1.00-D1.40, A1.00- A1.40, A2.31-A2.33, A3.00, A3.01, | Photo numbers <u>5.18</u> | Drawing numbers <u>A4.00, A5.01, A5.21, A6.01</u> |
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Describe work and impact on feature

At perimeter walls and interior walls slated to remain, broken and missing brick and clay tile walls will be replaced to match the existing. Brick and clay tile partition and closet walls will be selectively removed at the first level to accommodate the new unit layout, and at the mechanical shaft at the fifth level. The existing mechanical chases in the perimeter walls will remain as they are and will be reused to the extent possible. The chases will be covered with gypsum board over steel channels (see Item #25 and #29 for more details). Some interior CMU walls will be removed at the fifth level. The fifth-level perimeter CMU walls supporting the roof structure and the CMU walls of the penthouse will remain.

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Seven historic window openings infilled with CMU at the fourth level light well will be made taller and converted to door openings to provide access to residential units and the new west stair shaft (see Items #3 and #22). The non-historic CMU infills and historic brick below the windows will be removed. Five window openings at the west end of the fourth-level light well will be infilled with CMU. Door openings will be converted to windows and window openings will be created at the CMU walls of the non-historic fifth-level center corridor to provide indirect natural daylight to the units flanking the fourth-level light well. Windows will be metal-framed, single lite, and fixed.

The steel-plated ceilings and beams will remain and be repaired. Surface corrosion will be removed with a wire brush. A rust-inhibitive primer and paint will be applied on the beams. Concrete floors will remain and be repaired in accordance with *Preservation Brief 15: Preservation of Historic Concrete: Problems and General Approaches*. Concrete rehabilitation work will include injecting cracks with an elastomeric, urethane, or polyurethane sealant to keep out moisture and reduce air infiltration. Sand will be applied onto the surface of the sealant to help conceal the repair and blend with the adjacent concrete. Sections of floor to be removed include: new mechanical chases from the first through fifth levels, the northeast corner of the building for the construction of a new stair shaft (see Item #22), the non-historic fifth-level corridor (see Item #20), and six locations at the fifth level for the creation of two-story units (see Item #17). Floor penetrations will be provided within units and support spaces to accommodate new HVAC, ductwork, and plumbing. Floor openings will be infilled with concrete at the first-level floor at the non-historic service stair, and the fourth-and fifth-level floors at the mechanical air shaft.

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| Number 13 |
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Feature Structure – Cell Framing Date of Feature 1924, various unknown

Describe existing feature and its condition

The second, third, and fourth levels feature a self-supporting steel-framed system that provides structural support for the jail cells and corridor walls. The steel-framed system is constructed of steel bars and plate walls that support the floors above. Floors are composite systems made of concrete over a steel-plated ceiling or concrete over clay tile over a steel-plated ceiling (see Item #12). The second- through fourth-level steel-framed system is supported by the second-level concrete slab.

The steel framing is typically in fair condition with evidence of surface corrosion and peeling paint. Framing is in poor condition at the third-level mechanical corridors (see Item #20) with severe corrosion of some steel angles and plates.

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| 2.07, 2.09, 2.11-2.15, 2.19, 2.23, 2.24, 2.26, 2.27, 3.10-3.13, 3.16- 3.18, 3.23, 3.24, 3.26-3.32, 4.06, Photo numbers <u>4.17-4.22, 4.29-4.31</u> | S1.20-S1.50, S3.00, D1.20, D1.40, A1.20, A1.40, A1.61, A1.70, Drawing numbers <u>A1.71, A2.10, A3.00</u> |
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Describe work and impact on feature

After nearly a decade of study and difficult rehabilitation attempts, the jail cells on the second through fourth levels have proven to be the greatest obstacle to the successful reuse of the St. Louis County Jail building. Given the density, small footprint, and negative connotations associated with the cells, some steel bar and plate cell walls will be removed to accommodate residential units at the second through fourth levels. Thanks to a sensitive design approach, almost 40% of the steel-plated and bar walls of the cells will be retained.

Given the self-supporting feature of the existing steel cell framing, the partial removal of some cell walls requires a structural strengthening of the floor framing. New steel beams and columns will be installed to retain and restore the structural capacity of the existing floor framing. Steel channel beams will be installed under the steel-plated ceilings of the second through fourth levels and be exposed. At connections with existing masonry walls, the steel beams will be pocketed into the masonry and bear on welded steel bearing plates anchored into the masonry. Steel tubular columns will be installed throughout the second and third levels and support the new beams; therefore reducing the amount of wall connections with the perimeter brick and clay tile walls (see structural drawings). The new columns will be typically concealed by new partition walls or installed within an existing steel-plated wall. Some columns will be installed within the steel-bar walls of the transverse corridors and the living room of the new units.

The steel-plated walls of the cells will remain exposed in the mechanical corridors.

Cell walls to remain that are located within units will be typically concealed within a new gypsum wall enclosure. Gypsum wall enclosures will be installed at demising walls and bathrooms to conceal plumbing, and between the kitchens and living rooms to conceal the steel bars. The upper portion of the steel bar walls between the kitchens and living rooms at the cells of the second and

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third levels will remain exposed to retain the feeling of transparency and diffusion of natural daylight, also respecting the historic use of the building. Historic steel-plated and bar walls will be either fully removed or partially removed to accommodate new doorways within the units. Steel plates will be salvaged and used to patch holes in the steel-plated ceilings (see Item #26). At the steel bar walls of the prisoners' and guards' corridors, the top portion of the bar wall will remain exposed and have a new steel channel on each side to retain a sense of the historic perimeter circulation (see detail 3/S3.00).

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Feature Lower Level Date of Feature 1924

Describe existing feature and its condition

The lower level consists of a large open space on the west side with support spaces on the east side. There is a transverse hallway to the west of the primary vertical circulation core (see Item #22). There is a historic vault at the east end of the open space. There are non-historic lockers along the south wall of the open space. The support spaces, which are articulated around the primary vertical circulation core, include a garage, a mechanical room, and storage rooms. There is a non-historic refrigeration room in the northeast storage room. The garage, which is at grade at West Second Street, is about three feet above the lower level's unfinished slab. The lower level is primarily unfinished with exposed concrete slab on grade, concrete columns, and painted stone, brick, and CMU walls. The clay tile perimeter walls are plastered. The lower level is connected to the St. Louis County Courthouse via a concrete tunnel (see Item #21).

The lower level is generally in fair condition (see Items #25, #26 and #27 on interior finishes).

S1.00, D1.00, A1.00, A1.73,
A1.80, A2.33, A3.00, A3.01,

Photo numbers L.01-L.23 Drawing numbers A4.00, A4.01, A6.01

Describe work and impact on feature

The lower level will typically continue to accommodate support spaces including tenant storage on the west side and mechanical rooms on the east side. The open space will consist of tenant storage boxes distributed by new double-loaded corridors. The historic vault will remain and be use as a storage room. The non-historic lockers will be removed. New interior wood stud walls clad with plywood will be constructed in the open space for tenant storage boxes. A water service room will be created at the northeast corner of the large open space. A laundry room will be provided in the southeast mechanical room. The garage will accommodate a trash/recycling room. The non-historic refrigeration room will be removed. The northeast storage room will accommodate one bathroom, one bedroom, and closets of the two-story unit #108 (see also Item #15). New interior gypsum walls will be constructed in unit #108. The elevator mechanical room will accommodate the new electrical service. A new concrete or metal stair and landing will be provided at the north side of this room to accommodate the difference in floor level with the hallway. At the open space, the upper portion of the new storage walls will consist of galvanized wire mesh, allowing the column capitals of the mushroom concrete slab to be exposed and visible from the new corridors (see also Item #12). Horizontal metal angles will be fastened to the new stud walls at the top and bottom of the wire mesh.

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Number 15

1924, ca. 1976, 1980, various

Feature First Level Date of Feature unknown

Describe existing feature and its condition

The first-level layout consists of partitioned office and support spaces distributed by a center double-loaded corridor on the western half of the building. The eastern half of the building features a lobby (see Item #19), a vault, additional office spaces, restrooms, and closets surrounding the primary vertical circulation core (see Item #22). There is a mezzanine level at the east end of the building above the lower-level garage that has a short double-loaded corridor, an office, and a few support spaces. There is a meat cooler at the northeast office that does not appear to be historic. Interior partition walls consist of historic clay tile walls finished with plaster and some non-historic CMU and gypsum board walls. Alterations made to the first level include the removal of interior partition walls at some offices and restrooms at the southwest corner of the building. The first level is typically finished with historic terrazzo flooring over a concrete slab, plaster walls, and suspended plaster ceilings. In addition, the vestibule, lobby, and southeast office also feature stone wainscot and cladding, and decorative crown mouldings. The southwest offices have non-historic dropped acoustical tile ceilings.

The first level is generally in poor condition because of the removal of the former vertical steam piping system in perimeter walls, non-historic alterations, and long-term deterioration patterns (see Items #25, #26, and #27 on interior finishes).

S1.10, D1.00, A1.00, A1.60,
A1.70, A1.71, A1.73, A1.74,
A1.80, A1.90, A2.10, A2.30,
A2.31, A3.00, A3.01, A4.00,

Photo numbers 1.01-1.47 Drawing numbers A4.01, A6.00

Describe work and impact on feature

The first level will generally consist of residential units on the western half and common spaces on the eastern half. Most of the historic clay tile office and closet walls will be removed to provide an efficient layout for the units (see Item #12). The vault will remain and be reused as a storage room. Non-historic CMU walls, gypsum walls, and the meat cooler will be removed. Typical studios feature an open kitchen/dining space with a sleeping area, and one bathroom. Typical one-bedroom apartments feature an open kitchen/dining space, one bedroom, one walk-in closet, and one bathroom. The northeast storage room will be converted to a two-story unit (room #108; see also Item #22). New interior partition walls will be constructed between and within the new units. New walls will not obstruct window bays. The mezzanine level will mostly remain as is (see Item #20). The historic vestibule, lobby, and southeast office will remain and be reused and their finishes will be mostly restored (see Items #19, #25, #26, and #27). New mail boxes will be provided at the west side of the north secondary entrance.

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| Number 16 |
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| | 1924, 1971, 1978, various |
| Feature <u>Second through Fourth Level</u> | Date of Feature <u>unknown</u> |

Describe existing feature and its condition

A transverse central corridor separates the second through fourth levels into two separate sections having cells. Each second- and third-level section has bath cells at its east ends. The finishes of the bath cells are not historic (see Item #25 and #27). The cells are distributed by prisoner’s corridors that run along the north and south sides of the building (see Item #20). The prisoners’ corridors are accessed through a safety vestibule on the second and third levels. There are guards’ corridors along the perimeter of the building on the second and third levels. The second and third levels share the same layout and structural load-bearing system (see Item #13). The fourth level features cells distributed by prisoners’ corridors at the west section. The center corridor at the west section used to be a light well (see Items #17 and #20). The east section has six non-historic cells along the north and east façades that are accessible via a horizontal circulation space that used to accommodate the school room (see Item #20). These cells have glazed concrete block walls. Cell #12 of the west section – see historical drawings – was altered to accommodate an additional shower room to the west of the juvenile and women’s recreation rooms. The second through fourth levels are primarily unfinished given their utilitarian function and typically feature exposed concrete floors, steel cell framing, steel-plated ceilings, steel beams, and plaster on perimeter walls. Each cell typically features one or two wall-mounted metal bed(s), one sink, one water closet, one radiator (fourth level only) and one wall- or ceiling-mounted light fixture.

The second through fourth levels are generally in poor condition (see Items #25, #26, and #27 on interior finishes).

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| | S1.30-S1.50, S3.00, D1.20, D1.40, A1.20, A1.40, A1.61, A1.70-A1.74, A1.81, A1.82, A2.10, A2.32, A2.33, A3.00, A3.01, A4.00, |
| Photo numbers <u>2.01-2.27, 3.01-3.32, 4.01-4.31</u> | Drawing numbers <u>A4.01, A5.01, A6.00</u> |

Describe work and impact on feature

The second through fourth levels will primarily consist of residential units and a few support spaces (electrical). Some of the historic steel-plated and bar walls of the cells and corridors, the historic wall-mounted beds, and the non-historic cells at the fourth level will be removed to accommodate new units (see also Items #13 and #20). Typical studios feature one kitchen, one living room with a sleeping area, and one bathroom. Typical one-bedroom apartments feature one kitchen, one living room, one bedroom, one walk-in closet, and one bathroom. Typical two-bedroom apartments feature one kitchen, one living room, two bedrooms, and one bathroom. At the fourth level, units on the west side of the transverse corridor will be two-story one- and two-bedroom apartments with a double-height ceiling at the dining space/living room (see also Item #17). At the second and third levels, unit entrances will be recessed from the corridor (see Item #20). At the fourth level, the historic light well will be reused as a corridor to provide access to the units (see Item #20). New interior partition walls will be constructed between and within the new units. New walls will not obstruct window bays.

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Feature Fifth Level Date of Feature 1924, 1978

Describe existing feature and its condition

According to archival sources, it appears that the roof of the fourth level was an outdoor space used as an exercise yard. The open-air yard was accessed through a penthouse at the fifth level. The construction of the fifth level in 1978 involved several alterations to the building, including: removal of the roofing materials and gypsum blocks at the fourth-level light well floor and installation of a new concrete slab, removal of the roofing materials and gypsum blocks at the fourth-level roof down to the historic steel-plated ceiling and installation of a concrete slab throughout the new fifth level (enclosing the fourth-level light well), construction of CMU walls along the perimeter of the new fifth level, and vertical extension of the fifth-level penthouse to provide access to the roof of the new fifth level. The fifth level is a primarily partitioned space that includes a recreation room, storage rooms, mechanical rooms, and community spaces (e.g. “television” and “music” rooms, see past drawings). The center double-loaded observation corridor providing access to these rooms is connected to the primary vertical circulation core to the east and fourth-level secondary stair to the west (see Item #22). The fifth level is mostly unfinished with non-historic painted CMU, gypsum board partitions, precast concrete roof deck, exposed concrete slab, exposed ductwork, and exposed piping.

The fifth level is generally in good condition (see Items #25, #26 and #27 on interior finishes).

S1.60, S4.00, D1.40, A1.40, A1.72,
A1.73, A1.74, A1.82, A2.32,
A3.00, A3.01, A4.00, A4.01,

Photo numbers 5.01-5.16 Drawing numbers A5.01, A6.01

Describe work and impact on feature

The fifth level will consist of residential units on the western half and mechanical rooms on the eastern half of the building. Some of the CMU and all of the gypsum interior partition walls will be removed. The non-historic concrete slab will be removed at the center corridor to restore the historic fourth-level light well and at six locations to create a double-height space at the dining space/living room of the units. The removal of the slab at the units aims to provide indirect natural daylight to the fifth-level bedrooms, thus avoiding the need for creating new window openings in exterior walls. The apartments will be two-story units (see Item #16 for unit descriptions). A new stair will be installed in the fourth-level dining space/living room to provide access to the bedrooms and walk-in closets at the fifth level (see also Items #16 and #22). New interior partition walls will be constructed between and within the new units. A mechanical unit will be installed in the west mechanical room (see Item #11).

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Feature Addition Date of Feature 1980

Describe existing feature and its condition

The non-historic addition consists of an open-plan center office space flanked by smaller offices at each end. The addition generally features an unfinished concrete slab, ceramic tile flooring, interior steel stud walls clad with gypsum, and dropped acoustical ceiling tiles.

The addition is generally in fair condition (see Items #25, #26 and #27 on interior finishes).

D1.00, D2.00, D2.01, A0.10,

Photo numbers 1.48-1.53 Drawing numbers A1.00, A2.00, A2.01

Describe work and impact on feature

The non-historic addition will be removed (see Items #1). The masonry of the 1924 building will be repaired at the junction with the addition (see Item #2 for more details).

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| Number 19 |
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Feature Circulation – Lobby and Vestibule Date of Feature 1924, ca. 1976, unknown

Describe existing feature and its condition

The main lobby is accessible from the primary entrance on the south façade of the building through a small vestibule (see Item #4). The lobby consists of a public space at the west and an open office space at the east. The lobby provides access to the central corridor, office spaces, and the elevator and stair of the primary vertical circulation core (see Items #22 and #23). The lobby space was altered over time, to include: installation of non-historic windows and door at the west counter at the public space and at the east end of the office space; installation of non-historic gypsum partitions and infills at the west and south sides of the primary stair shaft and northwest doorway; and removal of a door and counter at the public space. The lobby and vestibule were historically highly finished spaces featuring historic terrazzo flooring, stone wainscot and cladding, plaster walls, decorative crown mouldings, and suspended plaster ceilings concealing the second-level concrete slab.

The lobby is generally in poor condition. The vestibule is in fair to poor condition (see Items #25, #26, and #27 on interior finishes).

D1.00, A1.00, A1.60, A1.80,

Photo numbers 1.03-1.11 Drawing numbers A2.30, A2.31, A3.00, A3.01, A6.00

Describe work and impact on feature

The historic lobby and vestibule will be restored. Deteriorated or missing plaster walls, decorative crown mouldings, suspended plaster ceilings, stone wainscot and terrazzo flooring will be repaired (see Items #25, #26 and #27 for more details). The non-historic windows and door at the west counter of the public space and east end of the office space will be removed. The opening at the east end will be infilled with a new gypsum wall and door providing access to unit #107. The non-historic gypsum wall infill and partitions at the west and south sides of the primary stair shaft will be removed to restore the historic relationship between the lobby and the primary stair shaft, which is made possible by the creation of a new code-compliant stair at the northwest corner of the building (see Item #22 for more details). Extant historic counters will remain.

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| Number 20 |
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| | | 1924, ca. 1976 1978, various |
| Feature <u>Circulation – Corridors</u> | Date of Feature <u>unknown</u> | |

Describe existing feature and its condition

Horizontal circulation typically consists of single- and double-loaded corridors spanning west to east. A double-loaded corridor provides access to the offices and support spaces at the first and fifth levels. The historic first-level corridor leads to the addition at the west end of the building. The fifth-level corridor is not historic (see Item #17). There is a historic short double-loaded corridor at the first mezzanine level at the east end of the building providing access to an office and a few support spaces. There is a historic transverse corridor at the lower level. A historic transverse central corridor to the west of the primary vertical circulation core separates the second- through fourth-level layout into two separate sections. At the second and third levels, each section has a center mechanical corridor flanked by cells on each side. Prisoners' corridors provide access to the cells at the north and south sides of the building and a guards' corridor runs along the perimeter of the building. The mechanical, prisoners' and guards' corridors are all accessed via the transverse central corridor. Transverse corridors feature cell door operating devices on the west and east sides, and a vestibule and janitor's closet on the north side. At the east section of the fourth level, the guards' corridor was altered and extended towards the south façade to provide access to the non-historic cells along the perimeter of the building (see Item #16). At the west section of the fourth level, the current corridor used to be a light well prior to the addition of the fifth level (see Items #16 and #17). The light well has non-historic concrete flooring, painted historic brick walls, and non-historic exposed galvanized metal decking at the ceiling. There is a non-historic metal gate at the west end of the light well. There is a short double-loaded corridor at the northeast end of the non-historic addition leading to the center office space. Historic corridors are finished with terrazzo flooring or borders, concrete flooring, plaster walls, steel cell bars and plates, and painted steel-plated ceilings and galvanized metal decking. Non-historic corridors feature concrete flooring, CMU and gypsum walls, painted pre-cast concrete ceilings, and dropped acoustical tile ceilings.

Historic corridors are typically in poor condition with deteriorated or missing finishes. Non-historic corridors are generally in good to fair condition (see Items #25, #26, and #27 on interior finishes).

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| L.04, L.11, 1.12, 1.13, 1.44, 1.48, 2.05, 2.07, 2.08, 2.10, 2.12, 2.13, 2.16, 2.18, 2.20-2.24, 3.05-3.09, 3.11, 3.12, 3.14, 3.15, 3.17, 3.19- 3.24, 3.28, 3.29, 3.31, 3.32, 4.05- 4.09, 4.17, 4.18, 4.23-4.26, 4.29, | S1.30-S1.50, S3.00, D1.00-D1.40, D1.90, A1.00-A1.40, A1.61, A1.70-A1.74, A1.80-A1.82, A2.32- |
| Photo numbers <u>4.30, 5.05, 5.06</u> | Drawing numbers <u>A2.34, A3.00, A3.01, A5.01</u> |

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Describe work and impact on feature

At the lower level, new double-loaded corridors will be created at the west open space to provide access to the tenant storage. At the first level, the historic west corridor and east mezzanine corridor will mostly remain. Portions of the west corridor will be removed at the west end to create a new code-required stair shaft and doorway, and a new entrance for unit #106 (see Item #22). The east doorway at the west corridor will be enlarged. A door opening will be created for unit #103. Based on historical and past drawings, the historic doorway at unit #103 was infilled ca. 1976. Three west corridor door openings will be infilled with insulated steel stud framing finished with gypsum (see also Item #28). A portion of the short mezzanine corridor will be removed at the storage closet to connect the mezzanine level to the elevator.

At the second and third levels, the transverse central corridors will remain: steel bar and plated walls will remain exposed; the north janitor's closet and vestibule will remain; a furred wall will be provided at the elevator (see Item #23); one door operating device will remain and the two others will be removed to facilitate circulation within the corridor. The steel bar walls of the prisoners' and guards' corridors will be removed for the units. However, to retain a sense of the historic perimeter circulation, the top portion of the steel bar walls will remain exposed in the units (see Item #13). The majority of the steel-plated walls of the mechanical corridors will be retained, remain exposed, and be reused to provide access to the units. Steel plates will be selectively removed at the unit entrances to create a recess. The option of reusing the guards' corridor doorways as an entrance for the units adjoining the transverse corridors was explored. Reusing these doorways would require the removal of portions of the historic steel plated walls to bring the width of the doorways to code. To avoid this level of altering historic wall materials, access to these units will be provided through the utilitarian, mechanical corridors. The historic guards' corridor doorways will remain, be exposed, and be enclosed by a new gypsum partition wall at the unit side.

At the fourth level, the transverse central corridor will remain (treatments similar to the second and third level). The west prisoners' and east guards' corridors will be removed for the units. The light well will remain and be reused to provide access to the units. The non-historic metal gate will be removed. A new short corridor will be created to the east of the primary stair shaft to provide access to the new east units (see Item #22). At the fifth level, the corridor will mostly remain and be infilled with CMU or gypsum at the southwest and southeast portions to create a double-height light well.

Openings in interior walls will be infilled with CMU or gypsum at the first-level southeast office and the fifth-level vestibule. New door and doorway openings will be provided at the west steel-plated wall of the lower-level elevator mechanical room and the west brick wall of the trash/recycling room #009. New interior partition walls will be provided for the residential units and tenant storage. Typical new interior partition walls will consist of CMU or insulated steel stud walls finished with gypsum board.

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| Number 21 |
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Feature Circulation – Tunnel Date of Feature Unknown

Describe existing feature and its condition

The lower level is connected to the St. Louis County Courthouse via a concrete tunnel. The tunnel is accessed through a sloped floor at the southeast corner of the lower level (see Item #24). The tunnel has an exposed concrete floor and slab above, and painted concrete walls. The tunnel is infilled with a CMU wall and a flat slab single-leaf metal door about 20 feet away from the building. The portion of the tunnel on the property of the Courthouse is operated and maintained by the St. Louis County.

The concrete of the tunnel is in fair condition with peeling paint and staining likely due to water intrusion. The tunnel was not evaluated for structural integrity.

Photo numbers L.01, L.02 Drawing numbers D1.00, A0.10, A1.00

Describe work and impact on feature

The tunnel opening at the jail building will be infilled with CMU at the east perimeter wall of the building.

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Number 22

Feature Circulation – Stairs Date of Feature 1924, 1978, various unknown

Describe existing feature and its condition

The primary vertical circulation core includes a stair shaft and is located in the center of the building towards its eastern end. The stair shaft is historic and does not appear to have been altered over time except at the first, fifth, and roof levels (see Items #10, #17 and #19). The shaft runs from the lower level to the roof level and contains primary stair A. The shaft features historic painted steel-plated and plaster walls, a multi-divided steel window wall with wire or clear glass and steel safety bars at the west wall on the second through fourth levels, multi-divided lite steel windows with (painted) wire glass at the south wall, non-historic CMU walls at the fifth and penthouse levels, and painted pre-cast concrete planks at the ceiling of the roof penthouse. Stair A consists of a historic metal stair with metal railings, wood handrails, plaster at the underside of the stair flights and landings, terrazzo steps and landings at the lower through fourth levels, and a non-historic metal stair and railing at the fifth and penthouse levels. There are two secondary service stairs running from the lower to the first level: 1) one historic stair near the east end of the north façade (stair B) and 2) one non-historic stair leading to the office to the west of the lobby (stair C). The shaft enclosing stair B has historic steel-plated and plaster walls. Stair B is a historic metal stair with a metal railing, wood handrail, terrazzo steps and landings, and plaster at the underside of the stair flights and landings. Stair C is a concrete stair with non-slip rubber treads and risers. There is a non-historic secondary stair located in the middle of the fourth level center corridor of the west section (stair D) that runs from the fourth to the fifth level. Stair D is an unfinished concrete stair with wall-mounted metal handrails. The shafts enclosing stairs C and D are typically painted CMU walls.

Stair B and the historic portion of stair A are in fair to poor condition with peeling paint and evident signs of corrosion. The metal railing at stair B is partially missing. The non-historic portion of stair A, stair C, and stair D are in good to fair condition with staining, loose rubber risers at stair C, and signs of corrosion at the non-historic metal portion of stair A.

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| L.05, L.06, L.18, L.21, 1.03, 1.16, 1.38, 1.43, 2.01-2.03, 3.01-3.03, 3.06, 4.01-4.03, 4.25, 5.01-5.03, Photo numbers <u>5.06, 5.14, 5.17</u> | S1.00-S1.50, D1.00-D1.40, D1.90, A1.00-A1.50, A1.72-A1.74, A1.80- A1.82, A1.90, A2.32, A4.00, Drawing numbers <u>A4.01, A4.06, A6.00</u> |
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Describe work and impact on feature

The installation of a new code-compliant stair shaft is critical to the reactivation the building, as the historic primary stair A does not meet the code requirements. To reduce the amount of alterations to stair A, a floor opening will be created at the northwest corner of the building between the lower and the fourth levels to install a new stair shaft. The floor opening was designed to accommodate a stair layout that would not obstruct the north window bays of the west façade. The new stair shaft will be made of painted CMU walls, feature a metal stud framed interior wall finished with gypsum, have a wood stair, and a code-required metal gate at the first level. The existing floor slab will be supported by the new CMU walls and steel framing (see also

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Item #13).

The stair shafts, stairs, and finishes of the historic stairs A and B will remain. The terrazzo will be cleaned, sealed, and polished (see Item #27). Deteriorated plaster will be repaired (see Item #25 for plaster restoration). The metal stairs, steel-plated walls, multi-divided lite steel window wall with bars, and multi-divided lite steel windows will remain and be repaired. Surface corrosion will be removed with a wire brush. The steel walls, windows, and bars will receive a rust-inhibitive primer and be repainted with two coats of finish paint (compatible with the primer). The paint on the wire glass of the multi-divided steel windows at the south wall will be scraped. Stair A will be used as an exit access stair. Alterations at the shaft of stair A will include: removal of the non-historic gypsum infill and partition at the first level (see Item #19); removal of the lower-level east and south steel-plated and bar shaft walls; install a draft curtain and sprinklers at the ceiling of the first through fourth levels; install a furred wall finished with gypsum on both wall faces at the unit side of the shaft south wall (see detail 1/A6.00); enlarge the west door opening about 6 inches to the north to comply with code at the second through fourth levels; and enlarge the access panel opening on the east shaft wall to provide access to the mechanical corridors at the second through fourth levels. Enlarging the access panels at the east shaft walls allows the project to reuse the east mechanical corridors to provide access to the units; therefore avoiding alterations to the guards' corridor doorways (see Item #20). Metal railings and wood handrails will remain and be re-finished. The non-historic portion of stair A at the fifth and penthouse levels will remain. Stair B will be used as a private stair for the two-story unit #108. The west handrail will be removed to install a new interior partition wall enclosing unit #108. The handrail will be reused to rebuild the portion that is missing at the south side. The non-historic stairs C and D will be removed.

A new stair and landing will be provided at the lower-level elevator mechanical room (see Item #14). Six new stairs will be provided at the two-story units of the fourth level (see Items #16 and #17). Most stairs will be constructed of metal and have a spiral shape. The new stair at unit #406 will be made of wood and feature a code-required intermediate landing as the unit floor area at the fifth level will exceed 250 SF.

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| Number 23 |
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Feature Circulation – Elevator Date of Feature Unknown

Describe existing feature and its condition

There is a metal elevator that is part of the primary vertical circulation core of the building together with stair A. The elevator shaft is historic and runs from the lower to the fourth level. The elevator features a metal-paneled accordion door with wire glass lite at the shaft side and a metal-bar sliding door at the elevator cab side. In addition, there is a historic dumbwaiter to the east of the kitchen that runs from the first to the fourth level.

The elevator and dumbwaiter are not code-compliant and in fair to poor condition with peeling paint and evident signs of corrosion.

L.11, L.12, 1.33-1.36, 2.04, 3.01, D1.00-D1.40, A1.00-A1.40, A2.33,

Photo numbers 3.04, 3.06, 4.04 Drawing numbers A3.01, M1.00–M1.40

Describe work and impact on feature

The historic elevator shaft will be retained (see Item #22 on metal restoration). To avoid intrusive structural alterations to the historic elevator shaft and floor slabs around it, a custom-made front-rear elevator will be designed to fit within the existing enclosure. The elevator cab will be removed. The accordion and sliding doors will be removed for the installation of a fire-rated furred wall and smoke control door. One leaf of the first-level accordion door will be salvaged and hung to a new interior partition wall in front of the elevator shaft at the first level. An opening will be created at the west side of the shaft at the lower and first mezzanine levels to provide accessibility to the new trash/recycling room and historic office, respectively. The dumbwaiter equipment will be removed. The dumbwaiter shaft will remain and be reused to run new piping.

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| Number 24 |
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Feature Circulation – Ramps Date of Feature 1924

Describe existing feature and its condition

There is a concrete ramp at the southeast corner of the lower level leading to the tunnel (see Item #21). The ramp features a tubular metal railing at the west end. There is a short concrete ramp leading to the large open-space area of the lower level.

The concrete ramps are in fair condition with staining and miscellaneous debris on the top surface. The metal railing is in fair condition with surface corrosion.

Photo numbers L.03-L.05, L.14 Drawing numbers D1.00-D1.40, A1.00-A1.40, A5.01

Describe work and impact on feature

The ramp at the southeast corner of the lower level will remain and be cleaned. The metal railing will remain and be prepped, primed, and re-painted. The short concrete ramp leading to the west open space will remain and be cleaned. New wall-mounted metal handrails will be provided at each side of the new plywood partitions.

New short concrete ramps will be provided at the following locations to accommodate the difference in finished floor level with the new gypcrete flooring at the units (see Item #27 for more details): the east end of the west mechanical corridors and west end of the east mechanical corridors at the second and third levels; to the east of the light well at the fourth level, and at the new east short corridor at the fourth level. A small portion of the existing concrete slab at the west or east end of the second-level mechanical corridors, fourth-level corridor to the east of the light well, and fourth-level new east corridor (see Item #20) will be removed to feather up the new concrete ramps.

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| Number 25 |
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| Interior Finishes – Exterior and Feature <u>Partition Walls</u> | Date of Feature <u>1924, ca. 1976, 1980, various unknown</u> |
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Describe existing feature and its condition

The building features the following interior wall finishes:

1. Plaster. Plaster is typically found at the interior side of exterior walls, some interior walls at the lower level, and most interior walls at the first level.
2. Stone. The walls and columns of the lobby, the vestibule, and the first-level southeast office are finished with stone wainscot. Some salvaged stone wainscot is stored in an office at the first level.
3. Gypsum. There are several modern gypsum partition walls in the addition and at the first and fifth levels of the building. The shafts of stairs A and C have non-historic gypsum walls or infills at the first level.
4. Ceramic tile. The modern second- through fourth-level bath cells and fourth-level cells at the east section have non-historic glazed concrete block. A first-level shower and restroom feature non-historic ceramic tile and ceramic tile wainscot, respectively.

Plaster is in fair condition with hairline cracking and missing or peeling paint, and poor condition where it is cracked, loose, delaminating, missing, or has peeling paint. The stone wainscot and cladding are in fair to poor condition where it is broken, cracked, missing, or stained. Gypsum walls are generally in fair condition with staining, peeling paint, and missing areas. Glazed concrete block and ceramic tile are typically in good to fair condition with broken or missing tiles.

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| L.03-L.05, L.07-L.11, L.13-L.20, L.22, L.23, 1.01-L1.31, L1.34, L1.37, L1.38, L1.40-L1.42, L1.44, L1.46-L1.53, 2.08-2.10, 2.16, 2.18, 2.20-2.22, 2.25, 3.08-3.10, 3.14- 3.16, 3.19-3.22, 3.25, 4.07-4.10, 4.12, 4.15-4.18, 4.23-4.27, 4.29, Photo numbers <u>4.30, 5.01, 5.04-5.18</u> | S1.00-S1.40, D1.00-D1.40, D1.90, A1.00-A1.40, A1.60-A1.74, A2.30- A2.32, A3.00, A3.01, A4.00, Drawing numbers <u>A5.01, A5.31</u> |
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Describe work and impact on feature

Plaster walls at the first-level lobby, vestibule, southeast office, northeast kitchen, mezzanine office, and the second through fourth-level transverse corridors will be retained and repaired per *Preservation Brief 21: Restoring Historic Flat Plaster – Walls and Ceilings*. Hairline cracks and small holes in the plaster will be repaired with a two-coat application process. For spalling areas of plaster, a skim coat will be applied to match the existing adjacent surface. Larger holes will have remaining plaster removed and the new plaster will be applied and lapped over extant historic plaster to create a strong and seamless patch. Missing or large expanses of deteriorated plaster will be replaced with finished gypsum board over metal lath. The walls will be re-painted. Plaster at the perimeter walls and elsewhere in the building will remain as is and be furred out with

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gypsum board over metal channels to conceal the new electrical conduit and wiring required for the residential reuse; therefore avoiding the creation of chases in historic masonry walls or exposed conduit and wiring (see Item #30). Thermal expansion/contraction of the new furring wall system will not damage the existing masonry wall given the wall mass, thickness, and strength. At perimeter walls, no thermal insulation will be installed to reduce the possibility of freeze-thaw damages to the masonry. The vapor permeability of the gypsum will help prevent trapped moisture in the wall assembly. The change of wall thickness and interference with the window bays will be minimal given the shallow depth of the gypsum and metal channel furred wall (2 ¼ inches). Plaster will be locally removed at locations where new steel channel beams will be pocketed into the masonry wall (see Items #2 and #13). The existing stone wainscot and cladding will remain. Missing and cracked stone will be replaced with salvaged stone stored on site and a similar stone matching the existing. Alternately, substitute materials such as quartz or artificial stone resin panels will be used. Substitute materials will be compatible with the historic stone in appearance, size, and thickness. Their physical properties will be similar to the historic stone or they will be installed in a manner that tolerates differences in material properties. At the first-level southeast office, plaster walls and stone wainscot will remain as is and be furred out at the new kitchen and bathroom to conceal piping. Non-historic gypsum board walls and infills will be removed throughout the building (see also Item #19). The non-historic glazed concrete block and ceramic tile will be removed.

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Feature Interior Finishes – Ceilings Date of Feature 1924, ca. 1976, 1980, unknown

Describe existing feature and its condition

The building features the following ceiling types:

1. Plaster. Historic suspended plaster ceilings are found at the vestibule, the lobby, and most offices and support spaces of the first level. The first-level lobby, vestibule, and southeast office feature decorative crown mouldings. The underside of the stair flights and landings of stairs A and B are finished with plaster. Based on past drawings, the suspended plaster ceiling at the east section of the fourth level is not historic.
2. Steel plate. Exposed historic steel plate and non-historic galvanized metal decking are found at the ceilings of the second through fourth levels.
3. Dropped acoustical tile. Non-historic dropped acoustical ceiling tile systems were previously installed in the addition and at the first-level office located at the southwest corner of the building.
4. Gypsum. There is a non-historic gypsum board soffit along the perimeter walls at the fifth level.

Historic plaster ceilings and mouldings are in fair condition with hairline cracking and missing or peeling paint, and poor condition where they are cracked, loose, delaminating, missing, or have peeling paint. The non-historic plaster ceiling is in fair condition with holes and peeling paint. The steel-plated ceilings and galvanized metal decking are typically in fair condition with holes, peeling paint, and surface corrosion. The dropped acoustical tile ceilings are in poor condition with missing tiles. The gypsum board soffit is typically in good to fair condition with minor staining.

1.01-1.10, 1.12-1.23, 1.26, 1.28-
1.31, 1.33, 1.38, 1.40-1.44, 1.46,
1.48-1.50, 1.52, 1.53, 2.02-2.13,
2.16, 2.18, 2.20-2.24, 3.01-3.12,
3.14-3.17, 3.19-3.24, 3.28, 3.29, D1.00-D1.40, D1.90, A1.00-A1.40,
3.32, 4.01-4.12, 4.14, 4.15, 4.17, A1.60, A1.70-A1.82, A2.30-A2.33,
4.18, 4.20, 4.22-4.30, 5.02, 5.03, A3.00, A3.01, A4.00, A4.01,

Photo numbers 5.05-5.10, 5.12, 5.13, 5.15-5.18 Drawing numbers A4.06, A5.01, A6.00, A6.01

Describe work and impact on feature

Historic suspended plaster ceilings will be retained and repaired at the lobby, vestibule, and southeast office (see Item #25 on plaster restoration). Elsewhere in the building, the historic and non-historic plaster ceilings will remain as is and be covered with a new gypsum board ceiling. Deteriorated crown mouldings will be repaired matching the profile of the existing. Steel channels will be installed at the rear side of the mouldings to provide support and will be connected to the clay tile walls with wire ties. The ceilings and mouldings will be re-painted. Gypsum board will be installed at the ceiling of the flights and landings of stairs A and B where large areas of plaster is

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missing. Historic steel-plated ceilings will be retained and remain exposed. Holes will be patched with steel plates salvaged from the removal of some cell walls (see Item #13). Light rust, flaking, and excessive paint will be removed with manual or mechanical abrasion techniques, such as a wire brush. Steel-plated ceilings will be gently cleaned and primed with rust-inhibiting primer and repainted with two coats of finish paint (compatible with the primer). The non-historic galvanized metal decking at the fourth level ceiling will be removed to create a double-height light well. The non-historic dropped acoustical tile ceiling will be removed to restore the historic ceiling height. The gypsum board soffit will be removed. A gypsum board soffit will be installed at the bathroom of unit #107.

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Number 27

Feature Interior Finishes – Floors Date of Feature 1924, 1978, 1980

Describe existing feature and its condition

The building features the following floor finishes:

1. Terrazzo. Historic terrazzo flooring and base remain at the first and first mezzanine level, stair A, and stair B. The first-level corridor has terrazzo borders. The terrazzo flooring has a rubber floor base at some non-historic partition walls.
2. Stone. The vestibule and a small portion of the first-level landing of stair A features stone flooring.
3. Ceramic tile. The second- through fourth-level bath cells and first-level shower at the southwest corner of the building have non-historic ceramic tile installed on an elevated floor. The vestibule at the primary entrance of the 1980 addition has non-historic ceramic tile.
4. Concrete. The building features historic concrete floors at the lower level, some first-level support spaces, and the second through fourth levels. The concrete floors at the fourth-level light well, the fifth level, and the addition are not historic.
5. Steel. The third-level mechanical corridors feature unfinished structural steel plates and angles at the floor.

Terrazzo flooring is generally in fair condition with staining, cracking, and remnants of glue from previously removed non-historic flooring materials. Floor finishes between the terrazzo borders at the first-level corridors are missing. The stone flooring appears to be in good condition. The ceramic tile appears to be in good to fair condition with staining, dirt, and miscellaneous debris. The concrete floors appear to be in good to fair condition where cracked. Rubber floor bases are generally in fair condition with missing, loose, or stained floor bases. The steel plates and angles are in poor condition with severe signs of corrosion.

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| L.01-L.19, L.21-L.23, 1.01-1.10, 1.12-1.18, 1.20, 1.22-1.26, 1.28- 1.34, 1.37-1.44, 1.47-1.53, 2.01- 2.05, 2.07-2.27, 3.01-3.32, 4.01- | S1.00-S1.40, D1.00-D1.40, A1.00- A1.40, A1.70-A1.74, A2.31, A3.00, A3.01, A4.00, A4.01, A4.06, |
| Photo numbers <u>4.22, 4.24-4.31, 5.01-5.18</u> | Drawing numbers <u>A5.01, A6.00</u> |

Describe work and impact on feature

The terrazzo flooring will be retained and cleaned, sealed, and polished. Cracks will be patched with epoxy matching the existing. The terrazzo will be gently cleaned with a pH balanced cleaner. The rubber floor base will be removed. The first-level corridor will be finished with a self-leveling resin or epoxy between the terrazzo borders to create a code-compliant level surface. The stone flooring will be retained and cleaned. The non-historic ceramic tile flooring and elevated floors will be removed. Concrete floors will remain as is and be covered with an acoustic membrane and gypcrete flooring at the unit side of the second through fourth levels to provide acoustical insulation between floors and retain the exposed steel-plated ceilings (see Item #26). The steel at the third-level mechanical corridors and the concrete at the second-level mechanical corridors,

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fourth-level light well, and fourth-level new east corridor will be topped with a concrete slab to match the finished floor level at the unit side and create ramps providing accessibility (see Item #24). The third-level mechanical corridors steel plates and angles will remain as is and act as formwork for the new concrete slab that will provide a level surface. The concrete flooring will remain exposed and be sealed elsewhere throughout the building. Floor openings will be created at several locations (see Item #12).

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| |
|------------------|
| Number 28 |
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| | |
|--|--|
| Feature <u>Interior Finishes – Doors</u> | Date of Feature <u>1924, ca. 1976, 1980, various unknown</u> |
|--|--|

Describe existing feature and its condition

The building has historic sliding and hinged cell doors made of steel bars with a food slot, sliding steel-paneled doors with a three-by-three divided lite and a food slot, steel doors with multi-divided wire glass lights and safety bars, metal-paneled doors, metal-paneled doors with a transom above (metal-paneled transom, hopper-style transom with wire glass), and metal-paneled doors with a wire glass light, a mail slot and a louver. Additional historic metal-paneled doors are salvaged at the lower-level open space and in a first-level office. The building also features non-historic flat slab wood doors, flat slab wood doors with a clear or wire glass light, flat slab hollow metal doors, and flat slab hollow metal doors with a clear glass light at the first, fourth, and fifth levels. At the first-level corridor, the doors are not historic or missing; some historic doorways were infilled and new doorways were created in ca. 1976. The single-leaf aluminum door with a plexiglass lite at the vestibule is not historic. The east doorway at the fourth-level light well was partially infilled with CMU. The non-historic addition has flat slab wood doors.

Historic brass hardware remains on some historic metal doors. Non-historic wood and metal doors have brass/metal hardware.

The historic steel and metal doors are typically in fair to poor condition with evident signs of corrosion, peeling paint, non-code-compliant and missing hardware, where they are missing, and where they were altered (mail slot, louver, missing/altered transom, infilled door opening). The non-historic wood and metal doors are generally in good to fair condition with staining and minor finish deterioration.

| | |
|---|---|
| L.01, L.02, L.04, L.05, L.07, L.10, 1.02-1.13, 1.18, 1.20, 1.21, 1.23, 1.27-1.29, 1.32, 1.34, 1.38, 1.39, 1.42, 1.44, 1.45, 1.48, 1.50, 1.51, 2.01, 2.07, 2.11-2.13, 2.17, 2.19, 2.22-2.24, 2.26, 2.26, 3.01, 3.05, 3.06, 3.07, 3.11-3.13, 3.17, 3.18, 3.22-3.24, 3.26, 3.28-3.30, 4.01, 4.05-4.09, 4.11, 4.13, 4.15, 4.17- 4.19, 4.24-4.27, 4.29, 4.30, 5.01, | D1.00-D1.40, D1.90, A1.00-A1.40, A1.60, A1.61, A1.70-A1.74, A2.30-A2.33, A3.00, A3.01, A4.00, A4.01, A5.20, A5.21, A6.00 |
| Photo numbers <u>5.05, 5.06, 5.08, 5.11-5.13, 5.16</u> | Drawing numbers <u>A4.01, A5.20, A5.21, A6.00</u> |

Describe work and impact on feature

Historic metal doors will typically be removed throughout the building. Historic doors to remain include: the steel bar door at the lower-level hallway, the metal-paneled door at the north side of the lobby (fixed shut), most metal-paneled doors at the first-level mezzanine, some second-

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through fourth-level prisoner's corridor steel bar doors (fixed shut or in fully open position), the steel bar and wire glass doors at the west side of stair shaft A (fixed shut in fully open position), and the steel bar and plated doors at the vestibule and janitors closets of the second- through fourth-level transverse corridors. The interior side of the north door at the lobby will be covered by steel framing, insulation, and gypsum board. Existing transoms above doors to be retained at the first-level corridor will remain; however, they will be fixed shut. Non-historic infill materials will be removed and replaced with clear glass. Paint on transom lights will be removed. At doors to be removed, transoms will be salvaged. The feasibility of reusing salvaged transoms at new doors will be assessed. New first-level corridor doors will feature a transom matching the existing. Existing and new transoms will be protected with dedicated sprinkler heads (see Item #32). Non-historic doors will typically be removed throughout the building. The aluminum door at the vestibule will be removed and replaced with a new aluminum storefront door. The non-historic west door connecting the 1924 building to the 1980 addition will be removed to install a new exterior door (see Item #5). Doors and doorways will be partially or fully infilled with CMU or insulated steel stud framing finished with gypsum board at some locations at the historic first-level corridor and non-historic fifth-level corridor. Infills at the first-level corridor will be mostly done at historic door openings. The doorway of unit #104 that will be partially infilled is a non-historic doorway dated ca. 1976 (based on historical and past drawings). The fifth-level doors at the center corridor will be converted to window bays and infilled with CMU below the new windows. Windows will be metal-framed, single lite, and fixed. The CMU infill at the door opening at the east end of the light well will be removed to restore the historic door opening. Seven infilled window openings at the fourth-level light well will be enlarged to accommodate new doors for the units and new west stair shaft. The door opening in the steel-plated wall of the transverse central corridor leading to the west mechanical corridor providing access to the units at the second and third levels will be enlarged to four feet to match the width of the mechanical corridor. New solid core wood doors with code-compliant hardware will be provided throughout the building, hollow metal doors for service doors, and plywood doors at the lower-level tenant storage boxes. Historic doors salvaged at the lower- and first-levels will remain stored on site.

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| Number 29 |
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Feature Mechanical – HVAC System Date of Feature 1924, 1980, various unknown

Describe existing feature and its condition

Existing HVAC equipment is primarily located at the lower level. The building currently provides heat by means of historic radiators located below or next to exterior windows, and in the fourth level cells. Radiator piping is typically concealed on all floors. Ductwork for heating and ventilation is exposed at the lower level, some first-level offices, the second- and third-level mechanical corridors, and the fifth-level center corridor. Ductwork is concealed above the dropped acoustical tile ceilings at the addition.

The existing HVAC system appears to be in fair condition. The radiators and ductwork are generally in good to fair condition due to surface and paint deterioration.

L.03-L.05, L.07, L.08, L.10, L.11,
L.15-L.17, L.19, L.20, L.22, 1.01,
1.06, 1.14, 1.15, 1.22, 1.26, 1.48,
1.53, 2.08, 2.10, 2.16, 2.18, 2.20,
2.21, 3.08, 3.09, 3.14, 3.15, 3.19-
3.21, 3.31, 3.32, 4.12, 4.14, 4.17,
4.18, 4.20, 4.22, 4.29, 4.31, 5.05,

D1.00-D1.40, A1.00-A1.40,

Photo numbers 5.06 Drawing numbers M2.00-M2.60

Describe work and impact on feature

The existing HVAC system, associated ductwork and piping, and radiators will be removed. Hot water boilers will be installed at a fifth-level mechanical room. Hot-water baseboards with covers will be provided at the perimeter of the building to serve the units, common spaces, and support spaces. Baseboards will typically be flush-mounted throughout the building and recessed in existing wall cavities at the first-level lobby, unit #107, and unit #108. Baseboards will be controlled by integral thermostatic control valves. The vestibule, the new west stair shaft, and the tenant storage area at the basement level will be heated with electric unit heaters. The existing mechanical chases of the former vertical steam piping system in the perimeter walls will be reused to route the new vertical hot water piping risers to the extent possible. Pipe penetrations through floors and walls will also be created. Water meter and fire sprinkler equipment will be installed at the northeast corner of the large open space at the basement level. The exterior gas meter to the east of the primary entrance of the building will be replaced with a new gas meter. The new painted galvanized ductwork will be concealed by the historic suspended plaster ceilings at the first level and exposed at the lower level, fifth-level units, and fifth-level light well ceiling. In addition, new ductwork will be minimally exposed in a few units of the first through fourth levels due to the vertical air distribution provided by the new mechanical chases. Painted spiral duct (typically 4 inch round) will be installed tight to the walls and ceilings of the office #110, the living rooms of units #201 and #301, and the bedrooms of units #207, #208, #307, #308, #407, and #408. Per *Preservation Brief 24 - Heating, Ventilating, and Cooling Historic Buildings: Problems and*

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Recommended Approaches, the new ductwork will be installed such that future removal is possible without further damage to the building. Fire-smoke dampers will be provided at shaft penetrations. Horizontal wet venting will be typically provided for the sanitary system at the bathrooms of the units. To avoid a mechanical opening in the granite cladding or altering an historic window opening, a metal exhaust vent louver will be provided at the garage door transom to exhaust air from the laundry and trash rooms.

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Number 30

Feature Electrical – Power and Lighting Date of Feature 1924, 1980, various unknown

Describe existing feature and its condition

Electrical conduit is generally concealed by interior partition walls and suspended ceilings. The electrical conduit is also exposed in some spaces throughout the building along walls and ceilings. The majority of the interior light fixtures are not historic. Interior lighting primarily consists of historic, utilitarian, square metal light fixtures in the cells and some corridors of the second-through fourth levels (recessed at the second- and third-level cells), non-historic ceiling-mounted and suspended fluorescent strip light fixtures, non-historic wall-mounted light fixtures at the fourth-level cells, and non-historic dropped ceiling lighting. Exterior lighting is limited to modern wall-mounted single light fixtures located above the overhead garage door, at the northeast corner of the building, and on the east side of the secondary entrance on the north façade. There is a modern recessed round light fixture above the primary entrance of the addition.

The electrical conduit is typically in good to fair condition, as it is loose in some locations. The historic interior lighting is typically in poor condition due to corrosion and missing light covers. The non-historic interior lighting is in poor condition with missing fluorescent tube lights and loose wires. The non-historic interior lighting is generally non-sympathetic to the style of the building. It is unknown whether the interior and exterior lighting is operational.

L.03, L.04, L.05, L.07, L.11, L.17,
1.01-1.06, 1.10, 1.14, 1.15-1.19,
1.22, 1.23, 1.27-1.29, 1.42, 1.48-
1.50, 1.53, 2.04, 2.06, 2.08-2.10,
2.14, 2.15, 2.21, 3.04, 3.08-3.10,
3.14-3.16, 3.19-3.22, 3.26, 3.27,
3.30, 4.04-4.09, 4.11, 4.12, 4.14,
4.15, 4.17, 4.18, 4.21, 4.22, 4.24,
4.26, 4.28-4.30, 5.01, 5.02, 5.05-

C100, D1.00-D1.40, A0.10, A1.00-
A1.40, A1.70-A1.74, E0.01, E1.00-

Photo numbers 5.08, 5.13, 5.15-5.18 Drawing numbers E4.10

Describe work and impact on feature

The existing electrical distribution and panels will be removed and replaced throughout the building. A new transformer sitting on a concrete pad will be provided (see Item #1). New electrical rooms will be located at the former lower-level elevator mechanical room, a second-level cell (room #209), a third-level cell (room #309), and the fifth-level mechanical rooms. Individual metering shall be provided for resident units. New electrical conduit will be typically concealed in new interior and furred walls, and exposed on some existing walls/ceilings. New main telecommunication backboards will be installed in the former elevator equipment room at the lower level. An interior voice/data distribution system, CATV distribution system, telephone-type entry and access control system, and fire alarm and detection system will be provided. A fire alarm panel will be installed on the east wall of the vestibule. Exterior lighting will include general site

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and parking lighting. New modern and simple-in-design exterior light poles and fixtures will be provided at the east and south sides of the building. A wall-mounted photo control device will be installed at the west end of the south wall for exterior lights. The device will be connected to the wall through the mortar joints. Given their poor condition, historic and non-historic interior light fixtures, including the wall- and ceiling-mounted light fixtures in the cells, will be removed throughout the building. Interior lighting will consist of decorative pendant light fixtures in the lobby and first-level corridor, utilitarian metal square light fixtures in public corridors, architectural LED lightbars in the second- through fourth-level recessed unit entrances, simple-in-design light fixtures in the units; LED strip-luminaires in support and storage spaces, LED emergency battery packs for emergency egress illumination, and LED exit fixtures with battery backup. Occupancy sensors will be provided throughout the building. Power receptacles will be installed throughout the building. Stand-alone smoke detectors will be installed in bedrooms and smoke/CO detectors in corridors.

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Number 31

Plumbing – Piping Layouts and

Feature Fixtures Date of Feature 1924, 1980, various unknown

Describe existing feature and its condition

Plumbing fixtures throughout the building primarily consist of sinks, water closets, and showers in the bath cells. It is unknown whether the plumbing fixtures in the second- and third-level cells are historic. The plumbing fixtures throughout the first level and in the fourth-level cells do not appear to be historic. The showers are not historic. Piping is typically exposed at the lower level, the second- and third-level mechanical corridors, and the fifth level. The current roof drainage system consists of internal rainwater leaders.

The plumbing fixtures are generally in good condition at the showers and fair to poor condition elsewhere with evidence of staining and corrosion. The piping at the mechanical corridors is in fair condition with surface corrosion and paint deterioration.

L.03-L.05, L.07, L.08, L.10, L.11,
1.07, 1.19, 1.20, 1.24, 1.25, 1.47,
2.09, 2.11, 2.14, 2.15, 2.19, 2.25-
2.27, 3.10, 3.13, 3.16, 3.18, 3.25-
3.27, 3.30-3.32, 4.16, 4.21, 4.31,

D1.00-D1.40, A1.00-A1.40, A1.70-
A1.74, A6.00, A6.01, M1.00-

Photo numbers 5.04, 5.07 Drawing numbers M1.40

Describe work and impact on feature

The existing plumbing piping and fixtures will be removed and replaced throughout the building. The service sink in the janitor’s closet at the second- through fourth-level will remain as is (see Item #20). A separate fire sprinkler and domestic water service line will be extended from the site to the water service room at the northeast corner of the lower-level open space. The sanitary sewer service will be extended from the site to the building. Gas piping will be installed from the meter to the units and common areas gas-fired equipment (see also Item #29). A sump basket and pump will be provided for the new elevator pit drain. The sump pump will discharge into the sanitary system. New code-approved plumbing fixtures will be installed throughout the building, including: toilets, tubs/showers, shower valves, wall-mounted lavatories, faucets, and kitchen sinks. Plumbing piping will be concealed by the suspended plaster ceilings at the first level, the steel-plated ceiling at the third-level transverse corridor, furred walls at the units and some perimeter walls, and exposed elsewhere. Floor drains will be provided in the laundry room, trash room, and mechanical rooms.

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| Number 32 |
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Feature Fire Protection Date of Feature Unknown

Describe existing feature and its condition

Exposed sprinkler systems were observed at different locations throughout the building, including: the second- through fourth-level transverse central corridors, the fourth-level light well, the fifth level, and the shaft of stair A at the penthouse level.

The sprinkler system appears to be in good condition.

2.01, 2.04, 3.01, 3.06, 4.01, 4.04,
4.05, 4.24-4.26, 5.01, 5.05, 5.06, G0.01, G0.02, A1.00-A1.40,

Photo numbers 5.08, 5.13, 5.15, 5.16, 5.18 Drawing numbers M1.00

Describe work and impact on feature

The existing sprinkler systems will be removed and replaced with a new code-compliant system throughout the building. The replacement sprinkler system allows the transom windows to be retained in the first-level corridor of the building (see Item #28).

**SECTION 00 5200
AGREEMENT FORM**

PART 1 GENERAL

1.01 FORM OF AGREEMENT

- A. The Owner and General Contractor will use the *AIA A101-2017 Standard Form of Agreement Between Owner and Contractor*, herein attached.

END OF SECTION 00 5200



AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the day of in the year
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

New Burnham LLC
575 9th Street Southeast, Unit 215
Minneapolis, Minnesota 55401

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

The Burnham - Historic St. Louis County Jail
Duluth, Minnesota
LHB Project No. 180039

The Architect:
(Name, legal status, address and other information)

LHB, Inc.
701 Washington Avenue North, Suite 200
Minneapolis, Minnesota 55401
Telephone Number: 612-338-2029

The Owner and Contractor agree as follows.

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.

The parties should complete A101@–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201@–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

TABLE OF ARTICLES

| | |
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| 1 | THE CONTRACT DOCUMENTS |
| 2 | THE WORK OF THIS CONTRACT |
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| 7 | TERMINATION OR SUSPENSION |
| 8 | MISCELLANEOUS PROVISIONS |
| 9 | ENUMERATION OF CONTRACT DOCUMENTS |

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

(Check one of the following boxes.)

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

(Check one of the following boxes and complete the necessary information.)

Init.

/

[] Not later than () calendar days from the date of commencement of the Work.

[] By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work

Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be (\$), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item

Price

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. *(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

Item

Price

Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum: *(Identify each allowance.)*

Item

Price

§ 4.4 Unit prices, if any:

(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item

Units and Limitations

Price per Unit (\$0.00)

§ 4.5 Liquidated damages, if any:

(Insert terms and conditions for liquidated damages, if any.)

§ 4.6 Other:

(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than () days after the Architect receives the Application for Payment. *(Federal, state or local laws may require payment within a certain period of time.)*

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

§ 5.1.9 Except with the Owner’s prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor’s responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner’s final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect’s final Certificate for Payment, or as follows:

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

(Insert rate of interest agreed upon, if any.)

%

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:

(Check the appropriate box.)

- Arbitration pursuant to Section 15.4 of AIA Document A201–2017
- Litigation in a court of competent jurisdiction
- Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:

(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:

(Name, address, email address, and other information)

Grant Carlson
620 South Ninth Street
Minneapolis, Minnesota 55404

§ 8.3 The Contractor’s representative:

(Name, address, email address, and other information)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction
- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013 incorporated into this Agreement.)

.5 Drawings

| Number | Title | Date |
|--------|-------|------|
|--------|-------|------|

.6 Specifications

| Section | Title | Date | Pages |
|---------|-------|------|-------|
|---------|-------|------|-------|

.7 Addenda, if any:

| Number | Date | Pages |
|--------|------|-------|
|--------|------|-------|

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

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[] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

[] The Sustainability Plan:

| Title | Date | Pages |
|-------|------|-------|
|-------|------|-------|

[] Supplementary and other Conditions of the Contract:

| Document | Title | Date | Pages |
|----------|-------|------|-------|
|----------|-------|------|-------|

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor’s bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*

Grant Carlson, Owner

(Printed name and title)

CONTRACTOR *(Signature)*

(Printed name and title)

**SECTION 00 6100
BOND FORMS**

PART 1 GENERAL

1.01 BOND FORMS

- A. Prior to execution of this agreement form for the project, the Owner shall require that the General Contractor provide a Performance Bond and Labor and Material Payment Bond. Bond forms shall be AIA Document A312 - 2010, which are hereby incorporated for this Project.

END OF SECTION 00 6100

SECTION 00 7200
GENERAL CONDITIONS

PART 1 - GENERAL

1.01 FORM OF GENERAL CONDITIONS

- A. The general conditions of the contract for this project shall be AIA Document A201 – 2017.
- B. "General Conditions of the Contract for Construction" are a part of each section of the specifications and are hereby incorporated. For modifications to the aforementioned document, refer to Section 00 7300 for Supplementary Conditions.
- C. AIA Document A201 - 2017, General Conditions of the Contract for Construction are herein attached.

1.02 RELATED REQUIREMENTS

- A. Section 00 7300 - Supplementary Conditions.

END OF SECTION 00 7200



AIA® Document A201® – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

The Burnham - Historic St. Louis County Jail
Duluth, Minnesota

THE OWNER:

(Name, legal status and address)

New Burnham LLC
575 9th Street Southeast, Unit 215
Minneapolis, Minnesota 55401

THE ARCHITECT:

(Name, legal status and address)

LHB, Inc.
701 Washington Avenue North, Suite 200
Minneapolis, Minnesota 55401

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- 12 **UNCOVERING AND CORRECTION OF WORK**
- 13 **MISCELLANEOUS PROVISIONS**

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.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES



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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

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

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

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

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

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- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

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- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act

or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

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The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and

approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.



**SECTION 00 7300
SUPPLEMENTARY CONDITIONS**

THIS SUPPLEMENT shall modify, delete from and add and replace by substitution to the "General Conditions of the Contract for Construction", AIA Document A201, 2017 edition. Where any Article, Section or clause of the General Conditions thereof is modified or deleted by this Supplement, the unaltered provisions of that Article, Section or clause shall remain in effect. Any reference to "Owner's lender" shall mean any party providing financing to the Owner for the construction of the Project.

ARTICLE 1 GENERAL PROVISIONS

Add the following to the end of Section 1.2.1.

"In the event of conflicts or discrepancies among the Contract Documents, the issue shall be brought to the attention of the Architect for resolution. In making an interpretation the Architect will consider the following:

- .1 The Agreement.
- .2 Addenda, with those of later date having precedence over those of earlier date.
- .3 The Supplementary Conditions.
- .4 The General Conditions of the Contract for Construction.
- .5 Division 1 of the Specifications.
- .6 Drawings and Divisions 2-33 of the Specifications."

§1.2.1.2 If any portions of the proposed Agreement between the Owner and Contractor conflict with portions of the other documents, the Owner, Architect and Contractor shall be specifically notified of such items prior to execution of the agreement.

§1.2.1.3 In case of conflicts or discrepancies between Drawings and Divisions 02 through 33 of the Specifications or within either Document not clarified by Addendum, The Architect will determine which takes precedence in accordance with Section 4.2.11.

§1.2.1.4 By commencing with performance of the Work, Contractor acknowledges and agrees that the Contract Documents are adequate and sufficient to provide for the completion of the Work.

Add the following Subparagraphs to Section 1.5:

§1.5.3 The Architect may, with concurrence of the Owner, furnish to the Contractor versions of Instruments of Service in computer readable, editable format for use by design-build subcontractors upon exercising a Limited License Agreement for Use of Electronic Documents provided by the Architect to the Contractor and payment of a fee of \$500 to the Architect. The Documents provided under this Limited License Agreement are not the Contract Documents and permitted uses of these documents will be described in the Limited License Agreement. Use of these Documents by the Contractor is done at its sole risk. The Contract Documents executed or identified in accordance with Section 1.5.1 shall prevail in case of an inconsistency with subsequent versions made through manipulatable electronic means involving computers.

§1.5.4 The Contractor shall not transfer or reuse Instruments of Service in electronic or machine readable form without the prior written consent of the Architect.

Delete Section 1.7 and replace with the following:

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties may use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, or other form, to establish the protocols for the development, use, transmission, and exchange of digital data.

Add the following Subparagraph to Section 1.7:

§1.7.1 The Conditions of the Contract, the Drawings, the Specifications, Addenda, and Modifications during the term of the project may be issued in the form of PDF files of the original documents and transmitted by electronic means such as internet file transmission, email or on a medium such as compact disks. Files transferred in such manner between the Owner, Architect and Contractor will have the same standing as the equivalent documents printed on paper. Other file formats equivalent to PDF files may be used if they are agreed to by all parties and if such file format may be secured, locked or made unalterable. Alterable electronic files (such as emails or word processing files) may be used for general communication but not for required project documents.

Delete the following from Section 1.8:

“and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form”

Add the following Sections to Article 1:

§1.9 COOPERATION AND COMMUNICATION

§1.9.1 Representatives of the Owner, Contractor and Architect shall meet periodically at mutually agreed upon intervals for the purpose of establishing procedures to facilitate cooperation, communication and timely responses among the participants. By participating in this arrangement, the parties do not intend to create additional contractual obligations or modify the legal relationships which may otherwise exist.

§1.9.2 Contractor shall provide all documents, reports and other information reasonably requested by any lender, escrowee or title insurer and shall cooperate with the lender, escrowee or insurer.

§1.9.3 The Owner's lender, if any, may designate an inspecting architect or other representative and Owner may require the concurrence of such architect or representative in each instance in which the approval of the Architect is required by any provision of these General Conditions or other Contract Documents. Contractor shall cooperate with such inspecting architect or representative.

ARTICLE 2: OWNER

Replace Section 2.3.6 with the following:

§2.3.6 The Architect shall furnish to the Contractor electronic document files in PDF form of all Contract Documents (except the Owner-Contractor Agreement) for purposes of making reproductions pursuant to Section 1.5.2.

Make the following change to Section 2.4:

Delete the word “repeatedly” in the first sentence.

ARTICLE 3: CONTRACTOR

Add the following Subparagraphs to Section 3.1:

§3.1.4 When the Contractor is selected on a negotiated basis, the Contractor shall provide preliminary services requested by the Owner necessary for defining schedule and cost. The Contractor may also be required to provide necessary information including:

- .1 Construction Budgeting
- .2 Construction Schedule
- .3 To the Architect to facilitate the design of the structure where components and/or assemblies are being designs and supplied by mean of a design-build delivery method.

§3.1.5 The Contractor shall provide such information at points necessary for the development of the project as requested by the Owner and Architect. The Contractor is responsible for having the appropriate and specific knowledge of the building use and construction necessary to provide such advice to the Owner and Architect. The Contractor shall also be responsible for defining the performance and design criteria for portions of the building that are being delivered by means of a design-build delivery method.

Add the following to Subparagraph to Section 3.2.1:

§3.2.1.1 Owner has made available to Contractor, and Contractor has studied the result of such information that it has as to subsurface conditions and site geology. Contractor represents that it is familiar with the Project site and has received the information it deems necessary concerning the conditions of the Project site. Contractor represents that it has inspected location of the Work and has satisfied itself as to the condition thereof, including, without limitation, the general structural, surface and subsurface conditions, assuming the sufficiency and accuracy of the borings and investigations concerning subsurface conditions undertaken by Owner or its representative. If requested by Contractor, Owner shall undertake such further investigations and studies as may be reasonably necessary or useful to determine surface and subsurface conditions. Based upon the foregoing inspections, understandings, agreements and acknowledgements, Contractor agrees and acknowledges (i) that the Contract Sum is just and reasonable compensation for all the Work; including all foreseen risks, hazards and difficulties in connection therewith; and (ii) that the Contract Time is adequate for the performance of the Work; and (iii) that Contractor shall exercise special care in executing subsurface work in proximity of known subsurface utilities, improvements and easements, all subject to the terms in Sections 3.7.4, 8.3 and 10.3.

§3.2.1.2 No change in the Guaranteed Maximum Price will be allowed on account of minor differences between noted and actual dimensions.

Delete Section 3.2.2 and replace with the following:

§3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. The Contractor hereby specifically acknowledges and declares that except as otherwise described in writing to the Owner prior to the date hereof the Contract Documents are comprehensive and sufficient to have enabled it to determine the cost of the Work and that the Drawings, the Specifications and all addenda are sufficient to enable the Contractor to construct the Work outlined therein. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

Add the following Subparagraph to Section 3.2:

§3.2.5 The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for the Architect to evaluate and respond to the Contractor's requests for information, where such information was available to the Contractor from a careful study and comparison of the Contract Documents, Field Conditions, Owner Provided Information, Contractor Prepared Coordination Drawings, or prior Project Correspondence or Documentation.

Add the following Subparagraph to Section 3.3.2:

§3.3.2.1 The Contractor shall be responsible for any act of omissions related to the design and construction of design-build components and systems.

Add the following Subparagraph to Section 3.3:

§3.3.4 The Owner or its approved representative shall have access to the Work site and all Work. No supervision or inspection by the Owner's representative shall relieve the Contractor of any of its obligations under the Contract Documents or give rise to a duty on the part of the Owner. No inspection performed or failed to be performed by the Owner hereunder shall be a waiver of any of the Contractor's obligations hereunder or be construed as an approval or acceptance of the Work or any part of the Work. Notwithstanding the foregoing, Contractor shall not be responsible for any inspections required in connection with any licenses Owner is required to obtain for its operation and occupancy of the completed project.

§3.3.5 Any changes in the Contractor's project management and supervision staff shall be approved in advance by the Owner.

Add the following language to the end of Section 3.4.1:

“The Contractor shall check all materials and labor entering into the Work and shall keep full detailed accounts thereof. The Contractor shall reject any materials that will not conform to the Contract Documents when properly installed if the defect or non-conforming attribute is reasonably discoverable.”

Add the following Subparagraph to Section 3.4.1:

§3.4.1.1 No change in the contract sum will be allowed for work performed outside of regular working hours either as required by the contract documents or elected by the Contractor.

Delete Section 3.4.2 and replace with the following:

§3.4.2 After the Contract has been executed, the Owner and Architect may consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 1 of the Specifications). By making requests for substitutions, the Contractor:

- .1 represents that the Contractor has personally investigated the proposed replacement product and determine that it is equal or superior in all respects to that specified;
- .2 represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
- .3 certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect’s redesign costs,
- .4 waives all claims for additional costs related to the substitution which subsequently become apparent including costs for unforeseen conditions arising out of the substitution as well as the costs incurred by subcontractors, suppliers and the Owner arising from the substitution; and
- .5 will coordinate the installation of the accepted replacement, making such changes as may be required for the Work to be complete in all respects.
- .6 acknowledges that the Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect to evaluate the Contractor’s proposed substitutions and to make agreed upon changes in the Drawings and Specifications made necessary by the Owner’s acceptance of such substitutions.

Add the following Subparagraph to Section 3.4:

§3.4.4 The Contractor shall maintain harmonious labor relations, prevent labor disturbances and shall not be entitled to any increase in the Contract time or increase in the Contract Sum for any labor disputes.

§3.4.5 Additional Labor: In the event the Project is substantially behind schedule and it is reasonably determined by Owner that the Substantial Completion Date as extended pursuant to the provisions of Article 4, is no longer achievable unless additional labor and/or overtime is used, Contractor shall provide such additional labor and/or overtime as may be necessary to bring the Project back on schedule.

Add the following to the end of Section 3.5.2

“The Contractor shall arrange for the Owner to have the benefit of and right to enforce all warranties by Subcontractors, Sub-subcontractors, suppliers, and manufacturers.”

Add the following Subparagraphs to Section 3.5:

§3.5.3 Manufacturers’ warranties and warranties by others shall not relieve the contractor of any of its responsibilities under the Contract Documents.

§3.5.4 Notwithstanding any provision hereof to the contrary, provided the Owner properly maintains the new trees, plantings, shrubs and/or landscaping, Contractor shall replace, at no expense to Owner, all new trees, plantings, shrubs or landscaping other than grass provided by the Contractor on the property which became diseased or died within two (2) years from the date of Substantial Completion. Replacement plantings required at the end of the guarantee period are to be guaranteed for one (1) additional year.

Add the following Subparagraphs of Section 3.7.1:

§3.7.1.1 The Contractor shall procure all certificates of inspection, use, occupancy, permits, plan review fees and licenses, pay all charges and fees other than SAC and WAC charges and park dedication fees, if any, and give all notices necessary and incidental to the due and lawful prosecution of the Work. The Contractor shall make arrangements for any required inspections and pay any associated fees and shall

obtain and pay for the Certificate of Occupancy for the project. Certificates of inspection, use and occupancy shall be delivered to the Owner upon completion of the Work in sufficient time for occupation of the Project in accordance with the approved schedule for the Work. The costs of such procurement, payment and delivery are included within the Contract Sum. Failure to obtain such approvals as are within the Contractor's control shall not extend the Contract Time.

§3.7.1.2 Contractor shall comply with all State and local laws for employment and payment of employees.

§3.7.1.3 The Owner shall pay for any fees related to the installation of sewer (SAC), electrical, gas, water (WAC) and other utilities required as well as any park dedication fees except as specified elsewhere. The Contractor shall secure and arrange for all necessary utility connections.

Add to following Subparagraphs to Section 3.7.4:

§3.7.4.1 Cost adjustment shall be determined by the Architect as described in Article 7.

Add the following Subparagraphs to Section 3.9.1:

§3.9.1.1 The Contractor shall employ a superintendent or an assistant to the superintendent who will perform as a coordinator for mechanical and electrical Work. The coordinator shall be knowledgeable in mechanical and electrical systems and capable of reading, interpreting and coordinating Drawings, Specifications, and Shop Drawings pertaining to such systems.

§3.9.1.2 The coordinator shall assist the Subcontractors in arranging space conditions to eliminate interference between the mechanical and electrical systems and other Work and shall supervise the preparation of coordination of drawings documenting the spatial arrangements for such systems within restricted spaces. The coordinator shall assist in planning and expediting the proper sequence of delivery of mechanical and electrical equipment to the site.

§3.9.1.3 The Contractor's superintendent shall remain on-site until completion of all punch list items.

Add the following Subparagraph to Section 3.9:

§3.9.4 The list of all supervisory personnel, including the project manager and superintendent, that the Contractor intends to use on the Project and a chain-of-command organizational chart shall be submitted to the Owner upon Owner's request.

Add the following Subparagraph to Section 3.11:

§3.11.1 The Contractor shall maintain all approved permit drawings in a manner so as to make them accessible to the Owner, governmental inspectors and other authorized agencies. All approved drawings shall be wrapped, marked and delivered to the Owner prior to final payment.

Delete Section 3.12.10 and replace with the following:

§3.12.10 The Contractor shall provide architectural or engineering services necessary to carry out the Contractor's responsibility for construction means, methods, techniques, sequences and procedures and, where specified, any such services necessary for the design of the building components and/or systems.

Add the following to the end of Section 3.12.10.1:

"The Contractor shall be responsible for determining the adequacy of the performance or design criteria required by the Contract Documents."

Add the following Subparagraph after Section 3.12.10.2:

§3.12.10.3 When systems are being provided on a design-build basis and the work is required by law to be performed by a licensed professional, the system design shall be engineered by a licensed professional engineer with expertise in the specific building type being designed. The engineer shall act as the responsible charge as defined by the State of Minnesota and shall "determine design policy, including technical questions, advises with client, superintends subordinates during the course of work and, in general the person whose professional skill and judgment are embodied in the plans, design and advice

involved in the work.” It is the responsibility of the design-build engineer to define and design the system both to the applicable codes and as necessary for the specific building type and intended use.

Add the following Subparagraphs to Section 3.12:

§3.12.11 The Architect’s review of Contractor’s submittals will be limited to examination of an initial submittal and one (1) resubmittal. The Architect’s review of additional submittals will be made only with the consent of the Owner after notification by the Architect. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for evaluation of such additional resubmittals.

§3.12.12 The Owner and Architect’s review of design-build components and systems is limited to basic integration into the structure and its aesthetics. The Design-Build Engineer is responsible for the design and review of all components and shall notify the Architect of the need to modify any portion of the building design necessary to incorporate any portion of the related system assemblies.

Add the following Subparagraph to Section 3.18:

§3.18.3 Contractor shall purchase liability insurance (including products and completed operations coverage) to insure this indemnity obligation and name as additional insureds the entities listed in **Exhibit A** to the Contract as well as those entities identified in Section 11.1.1.

§3.18.4 None of the foregoing provisions shall deprive Owner or the Architect of any action, right or remedy otherwise available to them at common law.

§3.18.5 In the event that the Contractor refuses to honor their indemnity obligations hereunder, the Contractor shall, in addition to all other obligations, pay the cost of bringing an action to enforce the indemnity, including attorneys' fees, to the party requesting indemnity.

§3.18.6: Contractor shall indemnify and hold harmless Owner and Owner's lenders, if any, against any assertion of claims for mechanics' liens by Subcontractors, Sub subcontractors or material suppliers and against any assertion of security interests by suppliers of goods or materials for labor, material, equipment or services for which Contractor has been paid.

Add the following Sections to Article 3:

§3.19 OTHER CONTRACTOR RESPONSIBILITIES

§3.19.1 The Contractor warrants and represents that the Contractor is financially solvent, able to pay its debts as they mature and possessed of sufficient working capital to complete the Work and perform its obligations under the Contract Documents in an efficient and capable manner;

§3.19.2 The Contractor is able to furnish the tools, materials, supplies, equipment and labor required to complete the Work and perform its obligations under the Contract Documents, and has sufficient experience and competence to do so;

§3.19.3 The Contractor is authorized to do business in the state where the Project is located and is properly licensed by all necessary governmental, public and other authorities having jurisdiction over the Contractor and the project;

§3.19.4 The person(s) executing the Owner-Contractor Agreement are properly authorized to do so; and

§3.19.5 The Contractor shall keep a daily log of who is working on site. All workers shall sign into log.

ARTICLE 4: ADMINISTRATION OF THE CONTRACT

Add the following Subparagraph to Section 4.2.2:

§4.2.2.1 The Contractor shall reimburse the Owner for compensation paid to the Architect for additional site visits made necessary by the fault, neglect or request of the Contractor.

ARTICLE 5: SUBCONTRACTOR

Delete Section 5.2.1 and substitute the following:

§5.2.1 The Contractor, as soon as practicable after award of the Contract, and before entering into any Subcontract, shall furnish in writing to the Owner through the Architect the names of persons or entities who are proposed as Subcontractors, including all Sub-subcontractors of every tier, including those who are to furnish materials or equipment directly to the Contractor. For each named person or entity, the Contractor shall include the name, address of principal places of business, and the portion of the Work to be performed. The Architect shall consult with the Owner and, after such consultation, may reply within 14 days to the Contractor in writing stating (1) whether the Owner or Architect has reasonable objection to any such proposed person or entity or (2) that the Architect required additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice or no reasonable objection.

Add the following Subparagraph to Section 5.2.1:

§5.2.1.1 Acceptance of any Materials Supplier or Subcontractor shall not imply acceptance of any material or product not specified in the Contract Documents.

Delete Section 5.2.2 and substitute the following:

§5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made an objection including any Subcontractor or Sub-subcontractor that proposes to perform any portion of its Work through a person or entity to whom the Owner or Architect has made an objection.

Delete Section 5.2.3 and substitute the following:

§5.2.3 If the Owner objects to a person or entity proposed by the Contractor, the Contractor shall propose another to which the Owner has no objection. No increase in the Contract Sum or Contract Time shall be allowed for such change.

Delete Section 5.2.4 and substitute the following:

§5.2.4 The Contractor shall not perform any portion of the Work through any persons or entities that are not disclosed to the Owner and Architect pursuant to Section 5.2.1, provided this Section 5.2.4 shall not be construed to require disclosure of individual employees of any such persons or entities other than their principals.

Add the following Subparagraphs to Section 5.2:

§5.2.5 The Owner may require the Contractor to change any Subcontractor or Sub-subcontractor previously approved and, if at such time the Contractor is not in default hereunder, the Contract Sum shall be increased or decreased by the difference in cost occasioned by such change. The Owner will be responsible for costs incurred by Contractor in connection with the removal of a Subcontractor or Sub-subcontractor under the immediately proceeding sentence, unless the Owner's request for removal was based on good cause.

§5.2.6 The Contractor shall not allow any Subcontractor or Sub-subcontractor to perform any portion of the Work unless such Subcontractor or Sub-subcontractor shall (1) provide on-site supervision of its portion of the Work through its officers or employees and (2) perform at least 50% (by value) of its portion of the Work through its own forces. The Contractor may ask the Owner to consent to variances from this standard in writing, which variances the Owner may accept in writing if the Owner determines, in the Owner's reasonable discretion, that such variance would be to the advantage of the Owner.

Add the following Subparagraph to Section 5.3:

§5.3.1 Notwithstanding any provision of Section 5.3 to the contrary, any part of the Work performed for the Contractor by a Subcontractor or its Sub-subcontractor shall be pursuant to a written Subcontract between the Contractor and such Subcontractor (or the Subcontractor and its Sub-subcontractor at any tier), which shall be prepared on a form of subcontract satisfactory to the Owner in all respects. Each such subcontract shall, where the context so requires, contain provisions that:

- .1 requires that such Work be performed in accordance with the requirements of the Contract Documents;
- .2 requires the Subcontractor to carry and maintain insurance coverage in accordance with the Contract Documents, and to file certificates of such coverage with the Contractor;
- .3 require the Subcontractor to submit certificates and waivers of liens for work completed by it and by its Sub-subcontractors as a condition to the disbursement of the progress payment next due and owing;
- .4 requires submission to Contractor or Subcontractor, as the case may be, of applications for payment in a form acceptable to Owner's lender and title company;
- .5 requires each Subcontractor to furnish to the Contractor in a timely fashion all information necessary for the preparation and submission of the reports required herein;
- .6 require that each Subcontractor continue to perform under its subcontract in the event the Contractor is terminated and the Owner shall take an assignment of said subcontract and request such Subcontractor to continue such performance; and
- .7 requires each Subcontractor to remove all debris created by its activities.

ARTICLE 6: CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

Add the following language to Section 6.2.2:

After the phrase "promptly notify the Architect" insert the words "and Owner".

ARTICLE 7: CHANGES IN THE WORK

Add the following Subparagraph to Section 7.1:

§7.1.4 The cost of changes shall be determined as described in this Article 7. All changes shall be subject to the limits on Overhead and Profit as described in Section 7.5. The Owner may request a complete detailed breakdown of all cost components before approving any change and the Contractor shall provide such information. The methods of determination of cost changes applying to the General Contractor shall apply the same way, in turn, to Subcontractors and Sub-Subcontractors.

§7.1.5 Should the Contractor find during the progress of the Work that, in its judgment, existing conditions or requirements make desirable, or beneficial, a modification in the Contract requirements, the Contractor shall promptly report such matters to the Architect in writing, for consultation with the Owner and then decision and instruction.

Add the following after Section 7.2.1:

§7.2.2 If a Change Order requires an adjustment to the amount of the Contract Sum, the method of determining the cost adjustment shall be as described in Section 7.5.

Delete Section 7.3.3 and substitute the following:

§7.3.3 If a Construction Change Directive requires an adjustment to the amount of the Contract Sum, the method of determining the cost adjustment shall be as described in Section 7.5.

Delete Section 7.3.4 and substitute the following:

§7.3.4 If the Contractor does not respond promptly or disagrees with the amount of the adjustment in the Contract Sum, the method of adjustment and amount of adjustment shall be determined by the Architect as described in Section 7.5. Documentation of any costs required by the Architect to calculate the adjustment shall be provided by the Contractor.

Make the following change to Section 7.4:

After the phrase "shall be in writing" add the words "to Contractor and the Owner."

Add the following Section 7.5 and subsequent Subparagraphs:

§7.5 The determination of the amount of adjustment to the Contract Sum for Changes In The Work shall be made by the following methods, listed in order of preference. The most preferred method is listed first; if, in the determination of the Architect, that method provides a satisfactory adjustment it shall be used. If it does not, in the determination of the Architect, provide a satisfactory adjustment, the next method shall be used and so on, in order, until a satisfactory adjustment is determined.

§7.5.1 If a Unit Price for the work is contained in the Contract Documents or on the Bid Form as a part of the Contractor's original bid, that price shall be used. Quantities shall be calculated as described elsewhere in the Contract Documents. The Contract Sum will be adjusted by the direct extension of the number of units and the unit prices, provided however that if the quantities originally contemplated are so changed that application of the agreed unit prices to the quantities of work proposed will create a hardship on the Owner or the Contractor, the applicable unit prices shall be equitably adjusted by agreement of the parties to prevent such hardship.

§7.5.1.1 Unit prices shall be deemed to include Overhead and Profit and Commissions as described in Section 7.5.4. No additional charges, fees, commissions or burdens shall be added to the Unit Prices.

§7.5.2 If a lump-sum cost adjustment is mutually agreed upon by the Owner and the Contractor, that price shall be used. Such lump-sum shall be based on the Contractor's detailed, itemized breakdown of the actual basic cost and addition of the Contractor's Overhead and Profit and Commissions as described in Section 7.5.4.

§7.5.3 If a Unit Price for the work may be reasonably calculated, in the determination of the Architect, based on the price of similar units of work previously included in the Project, that price shall be used. Quantities shall be calculated as described elsewhere in the Contract Documents. The Contract Sum will be adjusted by the direct extension of the number of units and the unit prices, provided however that if the quantities originally contemplated are so changed that application of the agreed unit prices to the quantities of work proposed will create a hardship on the Owner or the Contractor, the applicable unit prices shall be equitably adjusted by agreement of the parties to prevent such hardship.

§7.5.3.1 The Architect shall determine if the calculated Unit Prices include Overhead and Profit and Commissions. If they do not, Overhead and Profit and Commissions shall be calculated as described in Section 7.5.4. No additional charges, fees, commissions or burdens shall be added to the Unit Prices.

§7.5.4 If the methods described above do not result in a satisfactory adjustment to the Contract Sum, in the opinion of the Architect, the adjustment to the Contract Sum shall be the Actual Labor Cost as described in Section 7.5.4.1 plus the Actual Material Cost as described in Section 7.5.4.2 plus Overhead, Profit and Commission calculated as described in Section 7.5.4.3. Overhead, Profit and Commissions shall be subject to the limits described in Section 7.5.4.4.

§7.5.4.1 The Actual Labor Cost shall consist of the following:

- .1 Hours worked multiplied times hourly labor costs, itemized by each trade involved showing the hourly rates for each. Labor rates shall be the same for work to be added to of subtracted from the Project
- .2 The burden on labor, which shall be the actual costs of mandatory and voluntary fringe benefits including taxes on labor, worker's compensation, insurance on labor, unemployment taxes, and FICA.
- .3 The burden on labor may be indicated as a dollar/cents addition to the hourly rate or may be expressed as a percentage of the extended hourly rate costs. If required by the Owner or Architect, the Contractor shall furnish a detailed breakdown to justify the labor burden. The Owner reserves the right to reject any labor burden which is materially inconsistent with that charged by other similar contractors in like circumstances.

§7.5.4.2 The Actual Material Cost shall consist of the following:

- .1 Actual quantities of material and equipment with their actual unit costs
- .2 Applicable sales tax on materials.
- .3 Material cost shall be the actual cost to the Contractor and Subcontractor. Upon request, the Contractor and Subcontractor shall submit evidence to substantiate costs. Materials shall be quoted at trade discount prices, with quantity discounts applied where the quantities warrant. Cash or prompt payment discounts need not be credited. In any proposal with material credits, the credit shall be based on the actual Contract cost or the material, including trade and quantity discounts, less any changes actually incurred for fabricating a material or returning a material which has been delivered (i.e.: restocking charges).
- .4 Cost of transportation of materials if it can be documented that this was separate from, and not included in, the basic cost of the materials.
- .5 Cost of large tools such as excavators, generators, trucks, etc. when use of that equipment is solely attributable to the changes for which cost is being calculated. Small hand tool costs may not be added as material costs.

§7.5.4.3 The Overhead Profit and Commission shall be calculated as a percentage of the total of Actual Labor Costs and Actual Material Costs and shall be deemed to include the following:

- .1 field and office supervision and administration, including the field superintendent and administrative personnel;
- .2 insurance required under the terms of this Agreement, except that listed as part of the labor burden;
- .3 use of small tools;
- .4 shop burden
- .5 equipment rental, other than equipment described and included in Section 7.5.4.2 item .5.
- .6 design, drafting and estimating services done by or on behalf of the Contractor, Subcontractor or manufacturer involved in the change;
- .7 payment and performance bonds
- .8 cost of safety measures, including those imposed by OSHA;
- .9 shipping, drayage, and demurrage except as specifically included in Section 7.5.4.2 item .4.
- .10 parking charges
- .11 cleanup and debris removal
- .12 testing
- .13 all other costs except those enumerated under Sections 7.5.4.1 and 7.5.4.2
- .14 permits

§7.5.4.4 The Limits of Overhead Profit and Commission shall be as described herein regardless of any additional claims or documentation by the contractor for any items described in Sections 7.5.4.3,

- .1 The Contractor, for work performed by the Contractor's own forces, may add five percent (5%) to that work for Overhead and Profit on that work.
- .2 A Subcontractor, for work performed by the Subcontractor's own forces, may add five percent (5%) to that work for Overhead and Profit on that work.
- .3 Sub-Subcontractors may add Overhead and Profit on their work the same as for a Contractor or Subcontractor.
- .4 No Contractor, Subcontractor, or Sub-Subcontractor may add Overhead or Profit to the work of another.
- .5 The Contractor, for work performed by a Subcontractor or a Material Supplier, may add a five percent (5%) Commission (Markup) on the amount due that Subcontractor or Material Supplier.
- .6 A Subcontractor, for work performed by a Sub-Subcontractor or a Material Supplier, may add a five percent (5%) Commission (Markup) on the amount due that Sub-Subcontractor or Material Supplier.
- .7 To illustrate the above charges: a change involving work by the Contractor, materials from a Material Supplier, work by a Subcontractor and work and materials from a Sub-Subcontractor would be marked up as follows – The Sub-Subcontractor would be entitled to O&P on its own work and a Commission on the materials they purchased. They would calculate their total and pass it upward to the Subcontractor who would calculate a Commission on that Sub-

Subcontractor's invoice plus O&P on its own work. The Subcontractor would calculate that total and pass it upward to the Contractor who would calculate a Commission on that Subcontractor's invoice, a Commission on the materials directly purchased and O&P on the work done by the Contractor's own forces.

- .8 No further level of Subcontracting beyond a Sub-Subcontractor shall be allowed to add Overhead or Profit to work. Any parties contracted below that level may divide the Overhead and Profit claimed at the Sub-Subcontractor level as they agree upon.
- .9 For changes involving both add items to the project costs and credit to the project costs, the Overhead and Profit and Commission shall be applied only to the net difference by which the add items exceed the credit.
- .10 For changes resulting in a credit in the basic costs, a reasonable allowance for overhead, profit, and commission shall be credited to the Owner. If the Owner and Contractor do not agree on the amount of such credit, the amount of the credit will be as determined by the Architect.
- .11 The percentages for profit, overhead and commission allowed by the Owner may be less than the amounts set forth in subsections (.1) and (.2) above, depending on the nature, extent or complexity of the change, where the percentage is not commensurate with the responsibility and administration involved, such as the Contractor merely processing a substantial Change Order to a Subcontractor or the Contractor processing an order for additional equipment.

Add the following Section 7.6:

§7.6 If the Owner does not agree to a proposal of the Contractor for additional Work or changes in the Work, or, if the Owner does not deem it advisable or expedient to proceed on the basis of the Contractor's proposal, the Owner reserves the right to perform additional work or changes in the Work with its own personnel or to employ others for changes in the Work as described in Article 6.

ARTICLE 8: TIME

Delete the following phrase from Section 8.3.1, item 3:

"labor disputes,"

ARTICLE 9: PAYMENTS AND COMPLETION

Delete Section 9.1.2.

Add the following to the end of Section 9.2:

"No payments will be made for materials stored off site."

Add the following sentence to the end of Section 9.3.1:

"The form of Application for Payment, duly notarized, shall be a current authorized edition of the AIA® Document G702™ - Application and Certificate for Payment, supported by a current authorized edition of AIA Document G703™ - Continuation Sheet."

Add the following Subparagraphs to Section 9.3.1:

§9.3.1.3 Until Substantial Completion, as evidenced by a Certificate of Occupancy when required by the Authority Having Jurisdiction, the Owner shall make progress payments in the amount of ninety-five percent (95%) of the amount due the Contractor on account of progress payments.

§9.3.1.4 After Substantial Completion and until final completion, including delivery of O&M Manuals, submission of closeout documents, and completion of Owner training as required in the Specifications, the Owner shall pay ninety-five (95%) of the amount due the Contractor on account of progress payments. At the time the Work is 100 percent complete and accepted by Owner, the Architect shall authorize remaining partial payments to be paid in full.

§9.3.1.5 Change Order amounts should be listed on the Payment Applications on AIA Document G703™ as separate items and not be distributed to other lines.

Delete Section 9.4.1 and substitute the following:

§9.4.1 The Architect's Certificate of Payment shall be processed and forwarded to Owner, Owner's lender, if any, and the title insurance company within ten (10) days after the Architect's receipt of Contractor's Application for Payment. The Architect will either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. Within thirty (30) days after receipt by the Architect of Contractor's Application for Payment, Owner shall make payment to Contractor of the amount specified in the Certificate for Payment (which shall provide for all applicable retentions). The Owner will make a good faith effort to meet the preceding time schedule for payments to the Contractor, however, the time schedule for payments may be extended due to delays in approvals required by funding and reviewing agencies. Such payment by Owner shall not constitute approval or acceptance of any item of cost in the Application for Payment. No partial payment made hereunder shall be or be construed to be final acceptance or approval of that portion of the Work to which such partial payment relates or relieve Contractor of any of its obligations hereunder with respect thereto.

Add the following Subparagraph to Section 9.5:

§9.5.5 If Contractor disputes any determination by the Architect with regard to any Certificate of Payment, Contractor nevertheless shall continue to prosecute the Work expeditiously.

Delete Section 9.6.2 and substitute the following:

§9.6.2 Joint checks will be issued to the Contractor and Subcontractors. The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

Delete Section 9.6.4 and substitute the following:

§9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

Add the following Subparagraph to Section 9.8.3:

§9.8.3.1 Except with the consent of the Owner, the Architect will perform no more than one (1) inspection to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional inspections.

Delete the second sentence in Section 9.8.5 and replace with the following:

"Upon such acceptance and consent of surety, if any, the Owner may make payment sufficient to increase the total payments to 98 percent (98%) of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work and unsettled claims."

Add the following Subparagraphs to Section 9.9.1:

§9.9.1.1 Where partial occupancy is necessary for portions of the work, the Contractor shall determine, in conjunction with building officials, what portions of the work are necessary to be complete at the time of intended occupancy. If additional work, not a part of the Contract is necessary, such work shall be identified to the Owner with any associated costs for inclusion as a Change in Work.

§9.9.1.2 In the event of partial occupancy before Substantial Completion as provided above, the Contractor shall cooperate with the Owner in making available for the Owner's use and benefit (at Owner's proportional expense) such building services as heating, ventilating, cooling, water, lighting, telephone, elevators and

security for the portion or portions to be occupied, and if the Work required to furnish such services is not entirely completed at the time the Owner desires to occupy the aforesaid portion or portions, the Contractor shall complete such Work and/or make temporary provisions for such Work as soon as possible so that the aforementioned building services may be put into operation and use.

Add the following Subparagraph to Section 9.10.1:

§9.10.1.1 Except with the consent of the Owner, the Architect will perform no more than one (1) inspection to determine whether the work or a designated portion thereof has attained final completion in accordance with the Contract Documents. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect for any additional inspections.

Add Section 9.10.6:

§9.10.6 The Contractor shall supply information necessary for the Owner to obtain rebates from utility agencies for equipment installed as part of the work.

ARTICLE 10: SAFETY OF PERSONS AND PROPERTY

Add the following Subparagraph to Section 10.1:

§10.1.1 The Contractor shall comply with all applicable laws and regulations. Notwithstanding any language to the contrary, the Owner shall not have any responsibility for job site inspections or safety recommendations. Any inspections or observations by the Owner or the Architect are solely for the benefit of the Owner and shall not create any additional duties or obligations to anyone else.

Add the following Subparagraph to Section 10.2.8:

§10.2.8.1 Contractor shall promptly report to the Architect and Owner in writing all accidents arising out of or in connection with the Work that cause death, major personal injury or major property damage. The report shall give full details, including statements of witnesses, hospital reports and other information in the possession of Contractor. In addition, in the event of any serious injury or damage, Contractor shall immediately notify Owner and Architect by telephone of such accident.

Add the following sentence to the end of Section 10.3.2:

“For purpose of this Section, ‘rendered harmless’ shall mean that the material or substance will not cause bodily injury or death to persons such that the Work can proceed in accordance with applicable law.”

ARTICLE 11: INSURANCE AND BONDS

Add the following sentence to the end of Section 11.1.1:

“In the event of failure of Contractor to furnish and maintain such insurance or to furnish a satisfactory certificate therefor, Owner shall have the right to take out and maintain said insurance for it in the name of Contractor and deduct the cost thereof from the payments due under the Contract.”

Add the following Subparagraphs to Section 11.1.1:

§11.1.1.1 The Contractor shall maintain Liability Insurance of the type and amounts described on the attached **Exhibit A**.

§11.1.1.2 The insurance requirements as set forth in this document are minimum requirements only, and any additional coverages that may be necessary to further protect Contractor are the sole responsibility of Contractor. Contractor is responsible for determining that the Subcontractors are insured in compliance with insurance requirements within this contract and will protect them from claims under Workers' Compensation Acts, bodily injury, sickness or disease, or death of their employees or any person other than their employees and from the claims for damages or destruction of property. The premiums, costs, and charges for any such insurance shall be paid by each subcontractor at its own expense.

§11.1.1.3 Unless, in particular cases, the Owner and Contractor shall agree otherwise in writing, the Contractor shall require all Subcontractors to maintain insurance conforming to the provisions of this Section 11.1 and shall not allow its Subcontractors to begin work until the insurance has been so obtained and certificates of insurance approved. The Contractor shall require each Subcontractor to provide a 30-day written notice to the Contractor of cancellation to any of the insurance coverages. The Contractor shall

maintain on file all such required Certificates of Insurance, which file shall be available for inspection by the Owner upon request.

§11.1.1.4 Any retention and deductible amounts which may occur as part of the insurance coverages shall be borne by the Contractor.

§11.1.1.5 Each policy shall contain a provision that the insurer shall not cancel or modify the policy in the following way: An exclusion, addition or limit reduction by endorsement to the policy cannot occur without giving written notice to the Owner at least thirty (30) days before cancellation or modification becomes effective. Not less than fifteen (15) days prior to the expiration of any policy, the Contractor shall furnish the Owner evidence satisfactory to the Owner that the policy has been renewed or replaced by another policy conforming to the provisions of this section, or that there is not necessity therefore under the terms hereof.

§11.1.1.6 The Contractor shall furnish Certificates of Insurance, which shall specifically set forth evidence of all coverage required by the Contract Documents. The form of Certificate(s) shall be an ACORD Certificate. If so requested by the Owner, the Contractor shall submit copies of any endorsements that are subsequently issued amending coverage or limits.

§11.1.1.7 Contractor shall name the entities listed in Section 11.1.1 and all other entities listed on the attached **Exhibit A** as additional insureds to the Comprehensive General Liability and to the extent available at no additional cost to Contractor, Automobile Liability and other Liability Insurances.

§11.1.1.8 Optionally, the Contractor may elect – with prior written approval of the Owner – to obtain Project Management Protective Liability Insurance in lieu of coverage required by Section 11.1 and the Subparagraphs to Section 11.1, provided that the all protections required by those Sections and Subparagraphs are met or exceeded by that Insurance.

§11.1.1.9 Design-build engineers employed by the Contractor, by any Subcontractor or by any Material Supplier for work as a part of this Project shall carry appropriate coverage for errors and omissions insurance.

§11.1.1.10 Partial Occupancy: The builder's risk coverage described in **Exhibit A** shall allow for partial occupancy before completion of the project. Partial use shall not commence until written consent has been obtained from the insurance company. Contractor shall take all reasonable steps to obtain such consent. No actions with respect to partial occupancy shall be taken that would cause cancellation, lapse or reduction of insurance. The policy shall continue until the Owner purchases permanent insurance and assumes responsibility upon substantial completion.

§11.1.1.11 Loss-Of-Rent Insurance: The General Contractor shall provide loss of rent insurance with a minimum coverage as described on attached **Exhibit A**, payable to the Owner. The insurance requirements as set forth in the document are minimum requirements only and any additional coverage that may be necessary to further protect the contractor is the sole responsibility of the contractor. Amount of loss, when incurred, shall be calculated based upon Owner's rental history at comparable properties.

Add the following Subparagraph under Section 11.1.4:

§ 11.1.4.1 The lapse of the Contractor's insurance coverage shall constitute a default under this Agreement.

Add the following Subparagraphs to Section 11.1.2:

§11.1.2.1 The Contractor shall deliver the required bonds to the Owner not later than three (3) business days after the execution of the Contract, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

§11.1.2.2 The Contractor 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.

§11.1.2.3 Each bond required under the Owner-Contractor Agreement shall be in dual or multiple obligee form, as requested by Owner, and shall be for one hundred percent (100%) of the Contract Value from the commencement of the Work until one year after final completion. The performance bond shall survive acceptance of the Work by Owner to the extent of guaranteeing Contractor's performance under Sections 3.5 and 12.2.

§11.1.2.4 The following entities are to be added as multi-obligees to the payment and performance bonds: all parties described on attached **Exhibit A-1** as additional insureds on the Comprehensive General Liability Policy.

§11.1.2.5 Owner shall have the right to waive any bonds required to be provided, in which event the amount of the premium of any such waived bond, if included in the Contract Sum shall be deducted from the Contract Sum by appropriate Change Order, provided, however, that such decision to waive the bond requirement must be made prior to commencing the work in order to receive such credit.

Delete Section 11.4.1 and replace with the following:

§11.4.1 Contractor shall furnish to Owner and keep in force during the term of the Contract performance and labor and material payment bonds guaranteeing that Contractor will perform its obligations under the Contract and will pay for all labor and materials furnished for the Work. Such bonds shall be issued in a form and by a surety reasonably acceptable to Owner, shall be submitted to Owner for approval as to form, shall name Owner and its lender as obligees and shall be in an amount equal to at least 100% of the Contract Sum (as the same may be adjusted from time to time pursuant to the Contract). Contractor shall deliver the executed, approved bonds to Owner within seven days after execution of this Contract. The bonds shall be written in the approved lender form.

Make the following modifications to Section 11.5.1:

Add the following at the end of the last sentence: "except when Owner consents to allow a party with a claim to settle directly with the insurer."

ARTICLE 12: UNCOVERING AND CORRECTION WORK

Add the following Subparagraphs to Section 12.2.2:

§12.2.2.4 Upon request by the Owner and prior to the expiration of one year from the date of Substantial Completion, the Architect will conduct and the Contractor shall attend a meeting with the Owner to review the facility operations and performance.

§12.2.2.5 After completion of the work, the Contractor shall assist the Owner and Architect in reviewing work that may be considered non-conforming by the Owner and in determining the need for corrective measures or other course of action whether or not covered by any warranty.

Add the following sentence to the end of Section 12.3:

"If remaining payments due to the Contractor are not sufficient to cover the adjustment, Contractor shall pay the difference to the Owner."

ARTICLE 13: MISCELLANEOUS PROVISIONS

Delete the second sentence of Section 13.2.1 and replace with the following:

At lender's request Contractor will complete the Work upon appropriate provision for payment of the balance of the Contract Sum and upon the assumption by the lender of Owner's obligations under the Contract. Any entity which shall succeed to the rights of Owner shall be entitled to enforce its rights hereunder; however, in any event both Owner and Contractor shall remain legally responsible."

In addition, delete the words "either party" in the last sentence of Section 13.2.1 and replace with the words "the Contractor", and delete the words "that party" in the same sentence and replace with the word "it".

Add the following Subparagraphs to Section 13.4.1:

§13.4.1.1 The Owner shall pay for Geotechnical Testing related to Section 31 0000 – Earthwork, and for Required Special Inspections testing specifically listed in the documents.

§13.4.1.2 The Contractor shall bear all other costs of inspections, tests and approvals including:

- .1 Qualifying testing/certifications necessary to prove that materials or equipment comply with the contract documents prior to being used in the Work.
- .2 Preliminary tests and inspections for design purposes (e.g. concrete mix designs).
- .3 All other tests, inspections, and approvals required by the contract documents. The Contractor shall coordinate arrangements with the testing lab and furnish samples and materials as needed.

Add the following language to Section 13.4.3, immediately after the word "expense":

“including the cost of retesting for verification of compliance if necessary, until the Work in question does comply with the requirements of the Contract Documents, and all such costs shall not result in additional costs to the Owner.”

Add the following Subparagraph to Section 13.4:

§13.4.7 Certificates of occupancy (as applicable) and certificates of inspection testing and approval, including operating permits for any mechanical apparatus, such as boilers and air compressors which may be required to permit full use and occupancy of the premises by the Owner and tenants or which may be required by the Contract Documents shall be secured and paid for by the Contractor and promptly delivered to the Architect. This shall be a condition precedent to Substantial Completion of the Work. Architect's or any engineer's services required to obtain such certificates, permits, or approvals shall be paid for by the Contractor.

ARTICLE 14: TERMINATION OR SUSPENSION OF THE CONTRACT

Make the following change to Section 14.2.1.3

Delete the word “or” from the end of the sentence.

Make the following changes to Section 14.2.1.4

Delete the period at the end of the sentence and add “; or”

Add the following Subparagraphs to Section 14.2.1:

§14.2.1.5 If a petition in bankruptcy is filed by or against the Contractor, or if it makes a general assignment for the benefit of its creditors, or if a receiver is appointed on account of its insolvency, or files a petition, or consents to the filing of a petition against the Contractor, under any federal or state law concerning bankruptcy, reorganization, insolvency or relief from creditors, or if such petition is filed against the Contractor without their consent and is not dismissed within thirty (30) days, or if the Contractor is generally not paying their debts as they become due, or if the Contractor becomes insolvent, or if a receiver, trustee, liquidator, custodian or the like is appointed with respect to Contractor or takes possession of all or a substantial portion of its assets, or if Contractor consents to such an appointment, or if Contractor makes an assignment for the benefit of creditors.

Add the following to the end of Section 14.2.3:

“and after issuance of a notice of termination by the Owner the Contractor shall not access the site for any purpose without the express written consent of the Owner.”

Add the following language to Section 14.2.4, immediately after the word "thereby":

“plus Owner's direct and consequential damages as a result of Contractor's default.”

Add the following Subparagraphs to Section 14.2:

§14.2.5 The Owner may terminate the Contract, at its option, in the case of a casualty, condemnation or other event not within the Owner's reasonable control, without prior notice. In the event of such termination, the Contractor shall be entitled to payment in accordance with the provisions of Article 14 of these General Conditions.”

§14.2.6 Without limiting any of the foregoing provisions of this Article 14 or of the Contract Documents, if at any time during the term of this Agreement the progress of the Work, in Owner's sole but reasonable discretion, but after consultation with the Architect, is less than what is required to accomplish Substantial Completion of the Work (or, if applicable, of any phase of the Work) by the date(s) required by the Contract Documents, then such delay shall be deemed a default hereunder. If such default is not cured to the reasonable satisfaction of the Owner within seven (7) days after receipt by the Contractor of written notice from the Owner, Owner may, in addition to or (in Owner's sole discretion) as an alternative to any other remedy available under the Contract documents:

- .1 Then or at any time thereafter, without the necessity of giving any other written notice which may be required by the Contract Documents, at its sole option, by written notice to the Contractor, delete such portion of the Work as in the Owner's reasonable judgment will enable the Contractor to complete the Work (or applicable phase of the Work) by the date required by the Contract Documents, and undertake such Work separately by its own forces or by others, in which event the Contract Sum shall be adjusted by an amount reflecting the cost of undertaking such deleted Work including third party fees and additional development expenses to the Owner; and/or
- .2 Terminate the Contract upon written notice and thereafter neither party shall have any further right against the other except with respect to obligations incurred by virtue of Work performed in accordance with the Contract Documents prior to the date of such notice of termination.

ARTICLE 15: CLAIMS AND DISPUTES

Add the following Subparagraphs to Section 15.1.5:

§15.1.6.3 Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised contract schedule indicating all the activity affected by the circumstances forming the basis of the Claim. The time limit for any claim is per 15.1.2.

§15.1.6.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

END OF SECTION

EXHIBIT A
CONTRACTOR'S INSURANCE REQUIREMENTS

The Contractor's Insurance Requirements are as follows:

"All Risk" Builder's Risk Completed Value Certificate of Insurance:

- a. In an amount not less than the amount of the Construction Contract or 100% of the insurable replacement value of such building(s) or improvements (whichever is greater);
- b. Mortgagee clause naming **TBD** as Mortgagee;
- c. Loss Payee clause naming **TBD** as Loss Payee;
- d. Replacement Cost Valuation Basis;
- e. Must include an Agreed Value Clause (or no co-insurance);
- f. If applicable, Boiler and Machinery Coverage (no co-insurance);
- g. Flood Insurance, if applicable: in an amount equal to the lesser of the current amount of the loan(s) or the maximum limit of coverage under the Biggert-Waters Flood Insurance Reform Act of 2012;
- h. Insurer will provide the Owner with 30 days prior written notice in the event of cancellation, non-renewal or material change;
- i. Insurer must be authorized to transact business in the State of Minnesota and must have a Best's rating of A- or better (refer to www.ambest.com for rating information).

Comprehensive General Liability Certificate of Insurance (including operations, contingent liability, operations of subcontractors, completed operations and contractual liability insurance):

- a. Limits against bodily injury and property damage of not less than \$1,000,000 per occurrence and \$3,000,000 in aggregate. An umbrella excess liability policy may be used to meet such requirements;
- b. The following named as an Additional Insured:
 1. **New Burnham LLC**
575 9th Street Southeast, Unit 215
Minneapolis, Minnesota 55401
 2. **LHB, Inc.**
701 Washington Avenue North, Suite 200
Minneapolis, Minnesota 55401
- c. Insurer will provide the Owner with 30 days prior written notice in the event of cancellation, non-renewal or material change;
- d. Insurer must be authorized to transact business in the State of Minnesota and must have Best's rating of A- or better (refer to www.ambest.com for rating information).

Worker's Compensation Insurance

- a. In the statutory amount;
- b. Insurer will provide the Owner with 30 days prior written notice in the event of cancellation, non-renewal or material change;
- c. Insurer must be authorized to transact business in the State of Minnesota and must have a Best's rating of A- or better (refer to www.ambest.com for rating information).

Additional Insurance

- a. The insurance requirements set forth in these documents are minimum requirements only. Any additional coverages necessary to further protect the Contractor are the sole responsibility of the Contractor.

END OF SECTION

SECTION 01 1000
SUMMARY OF WORK

PART 1 GENERAL

1.01 PROJECT

- A. The Project shall consist of:

The Burnham - Historic St. Louis County Jail
Duluth, Minnesota

1.02 OWNER

- A. The Owner of the Project is:

New Burnham LLC
575 9th Street Southeast, Unit 215
Minneapolis Minnesota 55401

1.03 ARCHITECT

- A. The Architect for the Project is:

LHB, Inc.
701 Washington Avenue North, Suite 200
Minneapolis, MN 55401
Ph: (612) 338-2029

1.04 CONTRACT

- A. The Owner will enter into a single contract with the Contractor for the total Work as described in Section 00 5200 - Agreement Form.

1.05 COMMENCEMENT OF THE WORK

- A. The Contractor shall commence upon receipt of the executed contract, performance and payment bonds, and certificate of insurance by the Architect, but not before, receipt of Notice to Proceed from the Architect.

1.06 ALTERATIONS AND COORDINATION

- A. The Work of this Contract includes coordination of the entire Work of the project, including preparation of general coordination drawings, diagrams and schedules, and control of site utilization, from beginning of construction activity through project closeout and warranty periods.

1.07 CONTRACTOR USE OF PREMISES

- A. Contractor shall coordinate resident occupancy of units such that units can be fully occupied during non-working hours.

1.08 WORK ON OTHER PROPERTY

- A. Existing property on or adjacent to the site which is damaged and not designated for removal shall be patched to original condition.

1.09 CITY INSPECTIONS

- A. The City requires advance notice prior to the installation of utilities or roadway to allow for City inspection.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SCOPE

- A. The scope of the project includes redevelopment of the Historic St. Louis County Jail is a conversion of the existing 5-story building into multifamily housing with related parking and site work. The site work includes demolition of an existing 1-story building addition on the west side of the Jail building. Work for this project will be in a single contract.

1. The St. Louis County Jail is on the Minnesota State and National Historic Register. This project received approval for historic tax credits by the US Department of the Interior's National Park Service and the Minnesota State Historic Preservation Office based on the report that was compiled by the historic consultant, PVN. The report is included as part of the project and included in these Specifications. Several preservation briefs are referenced throughout the report and are included in these Specifications as reference material. It is imperative that the scope of work described in the report be carried out in order to maintain these approvals through the construction process.
2. Historic Tax Credits approval:
 - B. The Contractor will obtain and pay for the general building construction permit. The Contractor shall secure and pay for any other permits required for this project and the certificate of occupancy. Fees shall include any additional permit fees, plan check fees, inspection fees, and others customarily charged for the execution and completion of the Work. All conditions, terms, and fees related to securing building permits shall be verified by the Contractor. Prior to issuing building permits, the City will require that the Contractor has adequately completed, to the sole discretion of the City, the following items:
 1. The Contractor shall not commence work until the contract has been executed, bonding and insurance provisions have been satisfied and the Architect, on behalf of the Owner, has issued a notice to proceed.
 - C. The Contractor shall be responsible for the care and control of the construction site. The Contractor shall take all measures necessary for the safety of workers and the general public. The construction site will be maintained in a clean and orderly manner. The Contractor shall take care to protect existing utilities scheduled to remain. The Contractor shall take such measures as necessary to protect adjacent property belonging to others from damage during construction. The contractor shall protect surrounding landscape materials noted to remain as indicated on the site plan. The Contractor shall correct as required any such damage.
 - D. The Work shall be substantially complete and turned over to the Owner approximately 10 months from the commencement of Construction.

3.02 OCCUPANCY

- A. Prior to turning over the Project for occupancy, the following on site work and approvals must be completed:
 1. All required utility testing completed and accepted.

END OF SECTION 01 1000

**SECTION 01 2100
ALLOWANCES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cash allowances.
- B. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

- A. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.
- B. Section 01 2900 - Payment Procedures.

1.03 CASH ALLOWANCES

- A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts and material and installation labor, less cost of delivery to site.
- B. Architect Responsibilities:
 - 1. Consult with Contractor for consideration and selection of products, suppliers, and installers.
 - 2. Select products in consultation with Owner and transmit decision to Contractor.
 - 3. Prepare Change Order.
- C. Contractor Responsibilities:
 - 1. Assist Architect in selection of products, suppliers, and installers.
 - 2. Obtain proposals from suppliers and installers and offer recommendations.
 - 3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
 - 4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
 - 5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
 - 6. Installation of selected products and materials.
- D. Differences in costs will be adjusted by Change Order.

1.04 ALLOWANCES SCHEDULE

- A. **Allowance No. 1:** Include the stipulated sum of \$4,000 for installation of retaining wall address and building backlit sign.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2100

**SECTION 01 2300
ALTERNATES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Definition: An alternate is an amount proposed by Bidders and stated on the Bid Form that will be added to or deducted from base bid amount if the Owner decides to accept a corresponding change in either scope of work or in products, materials, equipment, systems or installation methods described in Contract Documents. Include as part each alternate, miscellaneous devices, appurtenances and similar items incidental to or required for a complete installation whether or not mentioned as part of the alternate.
- B. Coordination: Coordinate related work and modify or adjust adjacent work as required to ensure that work affected by each accepted alternate is complete and fully integrated into the project.
- C. Notification: Immediately following award of Contract, prepare and distribute to each party involved, notification of the status of each alternate. Indicate whether alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to alternates, if any.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ALTERNATES

- A. The General Contractor shall provide unit prices for the following "alternates" and any other that are deemed appropriate and necessary to achieve the desired project budget. All subcontractors including Mechanical and Electrical shall review the work required as listed and indicate the costs required to furnish and install the Work. The Owner shall have the right to accept options prior to the start of construction and will be incorporated by addenda.
- B. Alternates:
 - 1. **Alternate 1:** Provide and install pre-hung wood doors and frames in lieu of drywall frames and site-installed wood doors at interior dwelling unit doors. Wood casing shall be 1x3 paint-grade Poplar with radius at exposed corners.
 - 2. **Alternate 2:** Not used.
 - 3. **Alternate 3:** Not used.
 - 4. **Alternate 4:** Not used.
 - 5. **Alternate 5:** Install 6 MIL Polyethelene vapor barrier on one side of unit separation walls.
 - 6. **Alternate 6:** Not used.
 - 7. **Alternate 7:**
 - a. Base Bid: do not patch existing holes (related to plumbing, electrical routing, etc.) In steel corridor walls.
 - b. Alternate Bid: patch existing holes in steel corridor walls per detail 10/a6.01.

END OF SECTION 01 2300

SECTION 01 2513
PRODUCT AND SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. The materials and products specified establish a standard of quality which the Architect/Engineer has determined as necessary for this project to maintain this level of quality. It is not the intent to eliminate properly qualified bidders from competition but to confine the bidding to a level of quality as determined by the Architect/Engineer.
- B. Any party interested in having materials, brands, products, etc. considered for bidding other than that specified may submit such request in writing to the Architect/Engineer for approval. Approved products will be incorporated by addenda during the bidding period. It shall be the obligation of any party submitting such requests to provide supporting data. Requests for substitutions made after execution of the contract will be made only if the specified material is unavailable.
- C. If the proposed material or product is approved and used in the Work, the bidder shall assume all costs incurred on account of additional work and changes required to incorporate the product including work performed by others.
 - 1. If changes to the Contract Documents are required because the proposed substitution requires modifications to plans, other materials, components and/or systems, and/or design thereof, the Owner shall be reimbursed by the General Contractor by Change Order for its incurred cost for additional Architectural Services to make those changes to the Contract Documents.
- D. The Contractor's requests for changes in the products, materials, equipment and methods of construction required by the contract documents are considered requests for "substitutions" and are subject to the requirements specified herein. No substitutions will be allowed after execution of the contract. The following are not considered as substitutions:
 - 1. Revisions to the contract documents where requested by the Owner or Architect are considered to be "changes", not substitutions.
 - 2. Substitutions requested during the bidding period which have been accepted prior to the Contract Date are included in the contract documents and are not subject to the requirements of substitutions as herein specified.
 - 3. Specified Contractor options on products and construction methods included in the contract documents are choices available to the Contractor and are not subject to the requirements for substitutions as herein specified.
 - 4. Except as otherwise provided in the contract documents, the Contractor's determination of and compliance with governing regulations and orders as issued by governing authorities do not constitute "substitutions" and do not constitute a basis for change orders.

PART 2 PRODUCTS

2.01 GENERAL

- A. Requirements for individual products are indicated in the contract documents; compliance with these requirements is in itself a contract requirement. The Architect shall make the final decision on either to allow or not to allow substitutions. Except as otherwise indicated, where specified product requirements include the phrase ". . . as selected from the manufacturer's standard colors, patterns, textures. . ." or similar phrases, the Architect is subsequently responsible for selecting the color, pattern and texture from the manufacturer's standard product line.

2.02 SUBSTITUTION PROCEDURE

- A. Submit to the Architect via email a Request for Substitution on a copy of the sample "Request for Substitution" Form as included at the end of this Section for each product proposed for substitution, supported with complete data, drawings and samples as appropriate, including:
 - 1. Comparison of the qualities of the proposed substitution with that specified.
 - 2. Changes required in other elements of the Work because of the substitution.

3. Availability of maintenance service and source of replacement materials.
- B. A Request for Substitution constitutes a representation that the person submitting the request:
 1. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified,
 2. Will provide the same warranties or guarantees for the substitution as for the product specified,
 3. Will coordinate the installation of an accepted substitution into the Work, and make such other changes as may be required to make the Work complete in all respects at no additional cost to the Owner.
 4. Waives all claims for additional costs, under their responsibility that may subsequently become apparent.
- C. Architect will review Requests for Substitution with reasonable promptness, and notify all Bidders by Addendum of the decision to accept the requested substitution.
- D. Requests for Substitution not submitted in accordance with the procedures described in this Paragraph will not be reviewed or considered by the Architect.

2.03 WORK RELATED SUBMITTALS

- A. The Contractor's submittal of and the Architect's acceptance of shop drawings, product data or samples which relate to work not complying with requirements of the contract documents does not constitute an acceptable or valid request for a substitution, nor approval thereof.

2.04 GENERAL PRODUCTS REQUIREMENTS

- A. Provide products that comply with the requirements of the contract documents and that are undamaged and, unless otherwise indicated, unused at the time of installation. Provide products that are complete with all the accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

PART 3 EXECUTION

3.01 INSTALLATION OF PRODUCTS

- A. Except as otherwise indicated in individual sections of these specifications, comply with the manufacturer's instructions and recommendations for installation of the products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other work. Clean exposed surfaces and protect surfaces as necessary to ensure freedom from damage and deterioration at time of acceptance.

REQUEST FOR SUBSTITUTION FORM
THE BURNHAM - HISTORIC ST. LOUIS COUNTY JAIL

FORMS ARE DUE BY _____.

DATE: _____

TO:

Attention: Andy Madson
LHB, Inc.
701 Washington Ave North, Suite 200
Minneapolis, Minnesota 55401
E-mail: Andy.Madson@LHBcorp.com

SPECIFICATION NO. _____ PARAGRAPH NO. _____

SPECIFIED PRODUCT _____

PROPOSED SUBSTITUTION _____

REASON FOR SUBSTITUTION _____

ATTACH COMPLETE TECHNICAL DATA, LITERATURE AND SAMPLE IF APPLICABLE

- A. Does proposed substitution fail to satisfy, in any respect Characteristics specified for original product(s)? ___Y ___N
- B. Does substitution affect dimensions shown on Drawings? ___Y ___N
- C. Does substitution affect other trades? ___Y ___N
- D. Does the substitution require design changes to plan, materials, components and/or systems? ___Y ___N
- E. Does warranty differ from that specified? ___Y ___N
- F. If you indicated "Yes" to any of the items above, attach thorough explanation on your Company letterhead as follows:

- a. Explain any differences between proposed substitution and specified product.
- b. Summarize experience with product and manufacturer in Project area.

The undersigned states that the function, appearance and quality of the proposed substitution is equivalent or superior to the specified item, unless noted otherwise, and that all information above and attached is true and correct.

Submitted By: _____

Position: _____

Company: _____
Address: _____
City, State, Zip: _____
Telephone: _____
Date: _____
Signature: _____

For use by Architect

_____ Accepted
_____ Accepted as Noted
_____ Not Accepted
_____ Received Too Late

By: _____
Date: _____
Remarks: _____
Included in Addendum? _____ Yes _____ No
Addendum No. _____

END OF SECTION 01 2513

SECTION 01 2900
PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Coordination of both the listing and timing of reports and other activities so as to provide consistency and logical coordination between the reports. Make appropriate distribution of each report and updated reports to all parties involved in the Work including the Architect and Owner. Provide close coordination of the progress schedule, schedule of values, listing of subcontracts, schedule of submittals, progress reports, and payment requests.

1.02 PRECONSTRUCTION SCHEDULES

- A. Progress Schedule: Submit a progress schedule prior to commencement of the Work. On the schedule, indicate each major category or unit of work to be performed at the site, properly sequenced and coordinated with other elements of work. Update schedule as necessary to reflect current work status.
- B. Project Construction Schedule: Earlier completion dates may be established by Contractor subject to approval by Owner. Owner reserves the right to require Contractor to prosecute the work in accordance with the specified milestone durations. Completion or milestone dates earlier than required by the contract documents shall not be utilized in computing construction time extensions.
- C. Construction Schedule: The Construction Schedule shall indicate a completion date for the project that is no later than the project's required completion date.
 - 1. All activity durations shall be given in work days.
 - 2. Failure by Contractor to include any element of work required for performance of the contract shall not excuse Contractor from completing all work within the contract time.
 - 3. Seasonal weather conditions shall be considered and included in the planning and scheduling of all work influenced by high or low ambient temperatures and/or precipitation to ensure completion of all work within the contract time. Seasonal weather conditions shall be determined by assessment of average historical climatic conditions based upon the preceding ten year records published for the locality by the National Ocean and Atmospheric Administration (NOAA).

1.03 SUBMITTALS/CONSTRUCTION SCHEDULES

- A. Submittal Schedule: Prepare a schedule of work-related submittals. Correlate this submittal schedule with the listing of principal Subcontractors. Prepare the schedule in chronological order of submittals. Show category of the submittal, name of subcontractor, a generic description of the Work covered, related section numbers, the activity or event number on the progress schedule, the scheduled date for the submittal and the final release or approval by the Architect. Schedule shall allow a minimum of two weeks review by Architect and three weeks, if reviewed by Engineers. Schedule shall allow for at least one resubmittal.
- B. Meeting Schedule: Twice monthly progress meetings will be held to assess the progress achieved by Contractor during the previous work period (see Section 01 3100 - Project Management and Coordination, Project Management and Coordination, paragraph 1.03).
- C. Construction Revisions Schedule:
 - 1. Contractor shall update the schedule monthly or as directed by the Owner. Updating of the Construction Schedule to reflect actual progress shall not be considered revisions to the Construction Schedule.
 - 2. If, as a result of the monthly schedule update, it appears the Construction Schedule no longer represents the actual prosecution and progress of the work, Owner may require that Contractor submit a revision to the Construction Schedule at no additional cost to the Owner.
- D. Time Impact Analysis For Change Orders, Delays, And Contractor Requests:

1. When change orders are initiated Contractor shall submit a written Time Impact Analysis, illustrating the influence of each change order, delay, or Contractor request on the current contract completion date. Each Time Impact Analysis shall include a fragmentary network (Network Analysis) demonstrating how Contractor proposes to incorporate the change order, delay or contract request into the Construction Schedule. The Time Impact Analysis shall demonstrate the time impact based on the date the change is given to Contractor or the date the delay occurred, the status of construction at that point in time, and the event time computation of all affected activities.
 2. Activity delays shall not automatically justify an extension of the contract time. A change order or delay may result in absorbing available total float that may exist within an activity chain of the network, thereby having no effect on the contract completion date.
 3. Float or slack time is not for the exclusive use or benefit of either Owner or Contractor. Contract time extensions will be granted only to the extent that time adjustments for the activity(ies) affected by any condition or event which entitles Contractor to a time extension exceed the total float or slack time of a critical activity (or path) at the time of Notice to Proceed of such change and extends to the contract completion date.
- E. Recovery Schedule:
1. Should Contractor's Construction Schedule indicate that any of the mandatory specific or milestone dates or completion dates are delayed more that fourteen (14) days, Contractor may be required, at no extra cost to Owner, to prepare and submit a supplementary Recovery Schedule, in a form and detail appropriate to the need, to explain and display how he intends to reschedule those activities to regain compliance with the Construction Schedule during the immediate subsequent pay period.
 2. Prior to the expiration of the Recovery Schedule, Owner and Contractor shall determine the effectiveness of the Recovery Schedule and to determine whether Contractor has regained compliance with the Construction Schedule. If in the opinion of Owner, Contractor is still behind schedule, Contractor, in conjunction with Owner will prepare another Recovery Schedule, at Contractor's expense, to take effect during the immediate subsequent pay period.

1.04 SCHEDULE OF VALUES

- A. Prepare the schedule of values in conjunction with the preparation of the progress schedule. Provide breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation. Submit the schedule of values to the Architect at the earliest feasible date. Arrange the schedule with columns to indicate the generic name of item, related specification sections, the dollar value of the item, and the percentage of the Contract Sum to the nearest one-hundredth percent adjusted to total 100 percent. Show line items of indirect costs, and margins on actual costs, only to the extent such items will be individually listed in payment requests. Those major cost items that are not directly the cost of actual work-in-place, such as distinct temporary facilities, may be either shown as line items that are not directly the cost of actual work-in-place, such as distinct temporary facilities, may be either shown as line items in the schedule of values or may be distributed as general overhead expense.
- B. Update and resubmit schedule of values when change orders affect the listing and when the actual performance of the Work involves necessary changes of substance to the value previously listed.

1.05 PAYMENT REQUESTS

- A. General: Except as otherwise indicated, the progress payment cycle is to be regular. Each application must be consistent with previous applications and payments. Certain applications for payment, such as the initial application, the application at substantial completion, and the final payment application involve additional requirements.
- B. Waivers of Lien: For each payment application, submit waivers of lien from every entity (including Contractor) who could lawfully and possibly file a lien in excess of \$100 arising out of the Contract, and related to work covered by the payment. The Owner reserves the right to designate which entities involved in the Work must submit waivers. Each progress payment shall be submitted with waivers from the Subcontractors or sub-Subcontractors and suppliers

for the period of construction covered by the previous application. The final payment application must be submitted together with or preceded by final or complete waivers from every entity involved with performance or the Work covered by the payment request.

- C. Payment Application Times: The "date" for each progress "payment" is as indicated in the Owner-Contractor Agreement or, if none is indicated therein, it is the tenth day of each month. The period of construction work covered by each payment request is indicated in Owner-Contractor Agreement or, if none is indicated therein, it is the period ending 10 days prior to the date for each progress payment, and starting the day following end of preceding period.
- D. Application Preparation: Complete every entry provided for on AIA Document G702, including notarization and execution by authorized persons. Entries must match current data of schedule of values and progress schedule and report. Listing must include amounts of change orders approved prior to last day of the "period of construction" covered by application.
- E. Stored Materials: No payment will be made on materials in transit or not suitably stored on site. The Contractor shall provide back-up documents as may be requested by the Owner or Architect for review and approval of the request for payment.
- F. Initial Payment Application: The principal administrative actions and submittals which must precede or coincide with submittal of subcontractor's first payment application can be summarized as follows, but not necessarily by way of limitation:
 - 1. Listing of Subcontractors and principal suppliers and fabricators.
 - 2. Schedule of values.
 - 3. Progress schedule.
 - 4. Schedule of principal products.
 - 5. Schedule of submittals.
 - 6. Listing of Contractor's staff assignments and principal consultants.
 - 7. Performance and/or payment bonds.
 - 8. Evidence satisfactory to Owner that Contractor's insurance coverage has been secured.
 - 9. Data needed to acquire Owner's insurance coverage.
 - 10. Affirmative Action Plan.
 - 11. Federal Labor Standards/Wages
 - 12. Non-Collusion Affidavit
- G. Retainage: See Section 00 7300 - Supplementary Conditions for partial payment and retainage.

1.06 APPLICATION AT TIME OF SUBSTANTIAL COMPLETION

- A. A "special" payment application may be prepared and submitted by Contractor following issuance of Architect's "Certificate of Substantial Completion". The principal administrative actions and submittals, which must precede or coincide with such applications are noted in Section 01 7700 - Closeout Procedures.

1.07 FINAL PAYMENT APPLICATION

- A. The administrative actions and submittals, which must precede or coincide with submittal of Contractor's final payment application are noted in Section 01 7700 - Closeout Procedures.

1.08 CHANGE ORDERS

- A. The Contractor shall submit three signed copies of AIA G701. The Architect shall recommend acceptance to the Owner. If acceptable, the Owner will sign and return the forms to the Architect for distribution.

1.09 APPLICATION TRANSMITTAL

- A. Submit three executed copies of each payment application, with waivers of lien and similar attachments. Transmit each copy with a transmittal form listing those attachments, and recording appropriate information related to application in a manner to Architect. Transmit to Architect by means ensuring receipt within 24 hours.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION 01 2900

SECTION 01 3100
PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 ADMINISTRATIVE/SUPERVISORY PERSONNEL

- A. In addition to a full-time on-site General Superintendent, provide a Project Manager experienced in administration and supervision of building construction, including mechanical and electrical work. The Project Manager is to act as general coordinator of interfaces between units of work including scheduling and sequencing of work, sharing of access to work spaces, installations, protection of each other's work, cutting and patching, tolerances, cleaning, selections for compatibility, preparation of coordination drawings, inspections, tests, and temporary facilities and services. Both the Project Manager and the Project Superintendent shall be experienced in multi-family, wood-framed construction projects of comparable scale and shall be acceptable to the Owner.
- B. The General Contractor shall be responsible for coordinating the work of all Subcontractors including mechanical and electrical Contractors. Preparation and certification of mechanical and electrical systems shall be made by a licensed engineer. Record drawings shall be maintained.

1.02 SURVEY AND RECORDING

- A. Verify the layout information shown on the drawings. A registered land surveyor shall be employed by the Contractor to lay out the project including property lines, building corners, and floor elevation benchmarks. Working from lines and levels established by the plans, establish and maintain benchmarks and other dependable markers. Field verify, calculate and measure required dimensions as shown within recognized tolerances. Drawings shall not be scaled to determine dimensions. Advise entities performing work of marked lines and levels provided for their use.
- B. Electronic (CAD) Documents: Architect makes no warranty either expressed or implied as to the suitability of electronic documents for use by the Contractor. If provided, the electronic documents are for the convenience of the Contractor and use is done at their sole risk. CAD files are not incorporated into the Project Documents. The Contractor is advised to take field measurements of the existing conditions as it relates to their work and to carefully compare these findings to the Project Documents.
- C. Final as-built grade and grading surveys shall be performed and records submitted to City or County agencies that require them.

1.03 PRE-CONSTRUCTION CONFERENCE

- A. The General Contractor shall schedule a Pre-Construction Conference prior to the start of construction. Attendees shall include:
 - 1. Owner and/or Owner Representative.
 - 2. Architect.
 - 3. General Contractor including project manager and project superintendent.
 - 4. Principal subcontractors.
 - 5. Others that the Owner, Architect or General Contractor invite to the meeting.
- B. The agenda may include but is not limited to:
 - 1. Introductions of all attendees and their organizations and designated duties and responsibilities during construction.
 - 2. Review and discuss status of required pre-construction submittals including but not limited to proof of insurance coverage and executed bonds.
 - 3. Review list of Contract Documents.
 - 4. Review project scope.
 - 5. Review project progress schedule.
 - 6. Review the Schedule of Values.
 - 7. Communication procedures among General Contractor, Architect and Owner.

8. Review list of submittals and schedule.
9. Review Construction Progress meetings including schedule and mandatory and other typical agenda items.
 - a. General Contractor shall create meeting agenda and keep meeting minutes.
10. Discuss electronic document procedures for:
 - a. Submittal procedures.
 - b. Construction Observations and Reports.
 - c. Product substitution procedures.
 - d. Requests for Information.
 - e. Supplemental Instructions.
 - f. Proposal Requests.
 - g. Change Orders.
 - h. Applications for Payments.
 - i. Project Closeout.
11. Scheduling activities of Special Inspector and a Geotechnical Engineer.
12. Review and discuss Passive House US (PHIUS) certification inspections, testing, commissioning and other certification requirements. See Sections 01 4500 - Quality Control and 01 9100 - Green Building Requirements.
 - a. List of inspections, testing and commissioning.
 - b. Timing and scheduling of inspection, testing and commissioning over the duration of construction.
 - c. Owner shall designate individual certifiers and/or certification consultants.

1.04 PROJECT MEETINGS

- A. Construction Progress Meetings: Twice monthly progress meetings shall be held to discuss progress, schedule and other project construction related issues. Meetings shall include the Contractor, Owner, Architect and any necessary Subcontractor. The General Contractor shall provide an agenda for each meeting and prepare and distribute meeting minutes after each meeting.
- B. Pre-installation Conference: Prior to starting installation of each major component of the Work, the Contractor shall hold a pre-installation conference, attended by each entity involved or affected by planned installation. Include technical representatives of product manufacturers and others recognized as expert or otherwise capable of influencing success of the installation. Review significant aspects of requirements for the Work. The Contractor shall record discussion and distribute as plan of action.

1.05 PRE-INSTALLATION MEETINGS

- A. Conduct pre-installation meeting with manufacturer's representative, Owner, Architect, building official (invited), and other necessary parties to verify project requirements, substrate conditions, manufacturer's installation instructions, manufacturer's warranty requirements, and job-specific conditions as indicated in documents. Meetings to include but not be limited to pre-installation of the following materials as applicable to this project:
 1. Masonry.
 2. Concrete.
 3. Waterproofing.
 4. Windows.
 5. Siding.
 6. Roofing.
 7. Door Hardware.

1.06 PROJECT COORDINATION

- A. Make the following types of submittals in writing to Architect through the General Contractor:
 1. Requests for interpretation
 2. Requests for substitution.
 3. Shop drawings, product data, and samples.

4. Test and inspection reports.
5. Manufacturer's instructions and field reports.
6. Applications for Payment and Change Order requests.
7. Progress schedules.
8. Coordination drawings.
9. Project Closeout Submittals.

1.07 CONSTRUCTION PROJECT SIGN

- A. Contractor shall produce and erect a temporary construction project sign, 4' x 8', at time of construction start. Sign shall contain development name, names of funders (or their logos), Owner's name, General Contractor's name, Architect's name.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 INSTALLER'S INSPECTION OF CONDITIONS

- A. The Installer of each major unit of work shall inspect the substrate to receive work and the conditions under which the work is to be performed. The Installer shall report all unsatisfactory conditions in writing to the Contractor. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer. Do not install damaged or defective products, materials or equipment.

3.02 MANUFACTURER'S INSTRUCTIONS

- A. Where installations include manufactured products, comply with the manufacturer's applicable instructions and recommendations for installation, to the extent that these instructions and recommendations are more explicit or more stringent than requirements indicated in the contract documents.

3.03 GENERAL INSTALLATION

- A. Install work during time and under conditions which will ensure best possible result, coordinated with required inspection and testing. Anchor work securely in place, properly located by measured line and level, organized for best possible uniformity, visual effect, operational efficiency, durability, and similar benefit to Owner's use. Isolate non-compatible materials from contact, sufficiently to prevent deterioration.

3.04 MOUNTING DIMENSIONS

- A. Where mounting heights are not indicated, mount individual units of work at industry recognized standard-mounting heights for the particular application indicated. Refer questionable mounting height choices to the Architect for final decision.

3.05 CLEANING AND PROTECTION

- A. Clean each element of work at time of installation. Provide sufficient maintenance and protection during construction to ensure freedom from damage and deterioration at time of substantial completion.

END OF SECTION 01 3100

SECTION 01 3323
SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 GENERAL

1.01 SUBMITTAL PROCEDURES AND COORDINATION

- A. Coordinate the preparation and processing of submittals with the performance of the Work. Coordinate submittals and related activities such as testing, purchasing, fabrication, delivery and similar activities that require sequential activity. The Architect reserves the right to withhold action on any submittal requiring coordination with other related submittals. Prepare and transmit each submittal to the Architect sufficiently in advance of the scheduled performance of related work and other applicable activities. Allow sufficient time (minimum of 2 weeks) so that the installation will not be delayed as a result of the time required to properly process submittals, including time for resubmittal, if necessary. Advise the Architect on each submittal if the Work would be expedited if processing time could be shortened. No extension of time will be authorized because of the Contractor's failure to transmit submittals to the Architect sufficiently in advance of the Work.

1.02 SUBMITTAL PREPARATION

- A. Mark each submittal with a permanent label for identification. Provide a space on the label for the Contractor's review and approval markings, and a space for the Architect and the Architect's Consultant's/Engineer's "Action" marking.
- B. Package each submittal appropriately for transmittal and handling. Transmit each submittal by use of a transmittal form. Submittals received from sources other than the Contractor will be returned to the sender "without action". Record relevant information and requests for data on the transmittal form. On the transmittal form, or on a separate sheet attached to the form, record deviations from the requirements of the Contract Documents, if any, including minor variations and limitations. Contractor shall certify that the information submitted complies with the requirements of the Contract Documents by placing his stamp of approval on all submittals prior to transmitting them to the Architect. Indicate the name of the firm that prepared each shop drawing and provide appropriate identification in a title block. Provide one electronic copy of each submittal in PDF format (except samples). The Architect will return one electronic copy to the Contractor.

1.03 SHOP DRAWING SUBMITTAL REQUIREMENTS

- A. General: Information required on shop drawings includes dimensions, identification of specific products and materials which are included in the Work, compliance with specified standards and notations of coordination requirements with other work. Provide special notation of dimensions that have been established by field measurement. Highlight, encircle or otherwise indicate deviations from the contract documents on the shop drawings.
- B. Coordinate Drawings: Provide coordination drawings where required for the integration of the Work, including work first shown in detail on shop drawings or product data. Show sequencing and relationship of separate units of work which must interface in a restricted manner to fit in the space provided or function as indicated. Coordination drawings are considered shop drawings and must be definitive in nature.
- C. All exterior materials to be submitted prior to review of any exterior materials. All interior materials to be submitted prior to review of any interior materials.

1.04 PRODUCT DATA SUBMITTAL REQUIREMENTS

- A. General: Product data includes standard printed information on manufactured products that has not been specially prepared for this project. Information required specifically as product data includes manufacturer's standard printed recommendations for application and use, compliance with recognized standards of trade associations and testing agencies and the application of their labels and seals (if any), special notation of dimensions which have been verified by way of field measurement, and special coordination requirement for interfacing the material, product or system with other work.

- B. Preparation: Mark each copy to show which choices and options are applicable to the project. Where product data has been printed to include information for several similar products, some of which are not required for use on the project, mark the copies to show clearly that such information is not applicable.

1.05 SAMPLE SUBMITTAL REQUIREMENTS

- A. Samples are physical examples of work. Documentation required specifically for sample submittals includes a generic description of the sample, the sample source or the product name or manufacturer, compliance with governing regulations and recognized standards. In addition, indicate limitations in terms of availability, sizes, delivery time, and similar limiting characteristics. Submit samples for the Architect's visual review of general generic kind, color, pattern, and texture, and for a final check of the coordination of these characteristics with other related elements of the Work. Samples are also submitted for quality control comparison of these characteristics between the sample submittal and the actual work as it is delivered and installed. Provide samples that are physically identical with the proposed material or product to be incorporated in the Work. Provide full scale, fully fabricated samples cured and finished in the manner specified. Where variations in color, pattern, or texture are inherent in the material or product represented by the sample, submit multiple units of the sample (not less than three units), that show the approximate limits of variances. Where samples are specified for the Architect's selection of color, texture or pattern, submit a full set of available choices for the material or product.

1.06 MOCK-UPS

- A. Mock-ups are special forms of samples which are too large or otherwise inconvenient for handling in the manner specified for transmittal of sample submittals. Mock-ups and similar samples specified in individual work sections are special types of samples. Comply with sample submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

1.07 MISCELLANEOUS SUBMITTALS

- A. Inspection and Test Reports: Classify each inspection and test report as being either "shop drawings" or "product data" depending on whether the report is specially prepared for the project, or a standard publication of workmanship control testing at the point of production. Process inspection and test reports accordingly.
- B. Warranties: Furnish two executed copies of warranties, bonds or agreements. Provide two additional copies where required for maintenance agreements.
- C. Standards: Where submittal of a copy of standards is indicated, and except where copies of standards are specified as an integral part of a "Product Data" submittal, submit three copies of the standard for the Architect's use. Where workmanship, whether at the project site or elsewhere is governed by a standard, furnish additional copies of the standard to fabricators, installers and others involved in the performance of the Work.
- D. Record Documents: Furnish sets of original documents as maintained by the Contractor on the project site including a copy of approved shop drawings.
- E. Operating and Maintenance Data: Furnish two bound copies of operating data and maintenance manuals.

1.08 ARCHITECT'S ACTION

- A. Action Stamp: The Architect, and the Architect's Consultants/Engineers will stamp each submittal to be returned with a uniform, self-explanatory action stamp, appropriately marked and executed to indicate whether the submittal returned is for unrestricted use, final-but-restricted use (as marked), must be revised and resubmitted (use not permitted) or without action (as explained on the transmittal form). Submittals not required by contract documents will be returned without action.
- B. Returned for Resubmittal: Where the submittal is returned for correction and resubmittal, do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or

other activity. Revise the submittal or prepare a new submittal in accordance with the Architect's and/or the Architect's Consultants/Engineers notations stating the reasons for returning the submittal; resubmit the submittal without delay. Repeat if necessary to obtain a different action marking. Do not permit submittals with this type of marking to be used at the project site, or elsewhere where work is in progress.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 3323

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Submittals.
- B. Testing and inspection agencies and services.
- C. Control of installation.
- D. Defect Assessment.

1.02 RELATED SECTIONS

- A. Section 00 7200 - General Conditions: for Inspections and approvals required by public authorities.
- B. Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements and for submittal procedures.

1.03 REFERENCE STANDARDS

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2014).
- B. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2014.
- C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2013.
- D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.
- E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection and/or Testing; 2014a.
- F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2013.

1.04 SUBMITTALS

- A. See Section 013323 - Shop Drawings, Product Data and Samples, for submittal procedures.
- B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Conformance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.

1.05 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. Owner will employ and pay for services of an independent testing agency to perform Geotechnical testing.
- B. Contractor shall employ and pay for services of an independent testing agency to perform all other specified testing.

- C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- D. Contractor Employed Agency:

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TESTING AND INSPECTION

- A. See individual specification sections for testing required.
- B. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with specified standards.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
 - 5. Perform additional tests and inspections required by Architect.
 - 6. Submit reports of all tests/inspections specified.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.

5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
 - F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.03 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not conforming to specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION 01 4000

SECTION 01 4100
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. All work shall comply with governing regulations and codes and standards imposed upon the Work. This includes laws, statutes, ordinances and lawful orders issued by governing authorities, as well as those rules, conventions and agreements within the construction industry which effectively control the performance of the Work regardless of whether they are lawfully imposed by governing Agency or not.

1.02 INDUSTRY STANDARDS

- A. Applicability of Standards: Except where more explicit or stringent requirements are written into the contract documents, applicable construction industry standards have the same force and effect as if bound into the contract documents. Such industry standards are made a part of the contract documents by reference. Referenced Standards (standards referenced directly in the contract documents) take precedence over non-referenced standards that are recognized in the industry for applicability to the Work. Except as otherwise limited by the contract documents, non-referenced standards recognized in the construction industry are defined as having direct applicability to the Work and will be enforced for the performance of the Work.
- B. The decision as to whether an industry code or standard is applicable to the Work, or as to which of several standards are applicable is the sole responsibility of the Architect. Except as otherwise indicated, where compliance with an industry standard is required, comply with standard in effect as of date of contract documents. Where compliance with two or more standards is specified and where these standards establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the contract documents specifically indicate a less stringent requirement.
- C. Minimum Quantities or Quality Levels: In every instance the quantity or quality level shown or specified is intended to be the minimum for the Work to be provided or performed.
- D. Copies of Standards: Each entity performing work shall be experienced in that part of the Work being performed. Each entity is also required to be familiar with industry standards applicable to that part of the Work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 4100

SECTION 01 4500
QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. General: Required inspection and testing services are intended to assist in the determination of compliance of the Work with requirements specified or indicated. These required services do not relieve the Contractor of responsibility for compliance with these requirements or for compliance with requirements of the contract documents.
- B. Definitions: The requirements of this section relate primarily to customized fabrication and installation procedures, not to the production of standard products. Quality control services include inspections and tests and related actions including reports, performed by independent agencies and governing authorities, as well as directly by the Contractor. Specific quality control requirements of individual units of work are specified in the sections that specify the individual element of the Work. These requirements, including inspections and tests, cover both production of standard products and fabrication of customized work. These requirements also cover quality control of the installation procedures. Requirements for the Contractor to provide quality control services as required by the Architect, the Owner, governing authorities or other authorized entities are not limited by the provisions of this section.

1.02 RESPONSIBILITIES

- A. Contractor Responsibilities: Arranging inspections, tests and similar quality control services are the Contractor's responsibility; these services also include those specified to be performed by an independent agency and not directly by the Contractor. Costs for services as outlined in the Supplementary Condition 3.7.1 shall be paid by the Contractor. The Contractor shall employ and pay an independent agency, testing laboratory or other qualified firm to perform quality control services specified. The Contractor and each agency engaged to perform inspections, tests and similar services for the project shall coordinate the sequence of their activities so as to accommodate required services with a minimum of delay in the progress of the Work. If after testing, work is found not to meet the project requirements, the Contractor shall correct the deficiencies and retest at his own expense.
- B. The Contractor shall notify the appropriate building inspector prior to covering work that should be inspected including but not limited to the following:
 - 1. Prior to placement of concrete footings with reinforcing in place.
 - 2. Prior to backfilling, with the drain tile, damp-proofing, vapor barrier and protection board in place.
 - 3. During framing.
 - 4. Prior to installing exterior siding when windows, weather barrier, and flashing are installed.
 - 5. Prior to any drywall work, with mechanical, electrical rough-in complete; vapor barrier and insulation in place.

1.03 QUALITY ASSURANCE

- A. Except as otherwise indicated, engage inspection and test service agencies, including independent testing laboratories, which are pre-qualified as complying with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and which are recognized in the industry as specialized in the types of inspections and tests to be performed.
- B. Contractor is responsible for ensuring that buildings are caulked, sealed, and flashed as indicated in Drawings and Specifications prior to installation.

1.04 SUBMITTALS

- A. General: Refer to Section 01 3323 - Shop Drawings, Product Data and Samples for the general requirements on submittals. Submit a certified written report of each inspection, test or similar service directly to the Architect, in triplicate. Submit additional copies of each written report directly to the governing Agency, when the Agency so directs.

1.05 REPORT DATA

- A. Written reports of each inspection, test or similar service shall include, but not be limited to the following:
 - 1. Name of testing agency or test laboratory.
 - 2. Dates and locations of samples and tests or inspections.
 - 3. Designation of the work and test method.
 - 4. Complete inspection or test data.
 - 5. Test results.
 - 6. Interpretations of test results.
 - 7. Notation of significant ambient conditions at the time of sample-taking and testing.
 - 8. Comments or professional opinion as to whether inspected or tested work complies with requirements of the contract documents.
 - 9. Recommendations on retesting, if applicable.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ALTERING OF IN-PLACE WORK

- A. If any of the in-place work needs to be altered to accommodate any inspection, testing, sample-taking or other similar services, comply with the Contract Document requirements for Section 01 7329 - Cutting and Patching.

3.02 REPAIR AND PROTECTION

- A. Upon completion of inspection, testing, sample-taking and similar services performed on the Work, repair damaged work and restore substrates and finishes to eliminate deficiencies, including deficiencies in the visual qualities or exposed finishes. Comply with the Contract Document requirements for finishes. Protect work exposed by or for quality control service activities, and protect repaired work. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01 4500

SECTION 01 4533
CODE-REQUIRED SPECIAL INSPECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Code-required special inspections.
- B. Testing services incidental to special inspections.
- C. Submittals.

1.02 RELATED REQUIREMENTS

- A. Document 00 7200 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 01 3000 - Administrative Requirements: Submittal procedures.

1.03 DEFINITIONS

- A. Code or Building Code: ICC (IBC), 2015 Edition of the International Building Code and specifically, Chapter 17 - Special Inspections and Tests.
- B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.
- C. National Institute of Standards and Technology (NIST).

1.04 REFERENCE STANDARDS

- A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.
- B. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; 2011.
- C. AISC 360 - Specification for Structural Steel Buildings; 2010.
- D. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- E. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2008.
- F. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel; 2011.
- G. ICC (IBC) - International Building Code; 2015.
- H. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency shall:
 - 1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 - 3. Submit certification that Special Inspection Agency is acceptable to AHJ.
- C. Testing Agency Qualifications: Prior to the start of work, the Testing Agency shall:
 - 1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 - 3. Submit certification that Testing Agency is acceptable to AHJ.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION

- A. High-Strength Bolting Installation: Verify items listed below comply with AISC 360, Section M2.5.
 - 1. Snug tight joints; periodic.
- B. Structural Steel and Cold Formed Steel Deck Material:
 - 1. Structural Steel: Verify identification markings comply with AISC 360, Section M3.5; periodic.
 - 2. Other Steel: Verify identification markings comply with ASTM standards specified in the approved contract documents; periodic.
 - 3. Submit manufacturer's certificates of compliance and test reports; periodic.
- C. Welding:
 - 1. Structural Steel and Cold Formed Steel Deck:
 - a. Complete and Partial Joint Penetration Groove Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
 - b. Multipass Fillet Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
 - c. Single Pass Fillet Welds Less than 5/16 inch Wide: Verify compliance with AWS D1.1/D1.1M; periodic.
 - d. Plug and Slot Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
 - e. Single Pass Fillet Welds 5/16 inch or Greater: Verify compliance with AWS D1.1/D1.1M; continuous.
 - f. Floor and Roof Deck Welds: Verify compliance with AWS D1.3/D1.3M; continuous.
 - 2. Reinforcing Steel: Verify items listed below comply with AWS D1.4/D1.4M and ACI 318, Section 3.5.2.
 - a. Verification of weldability; periodic.
 - b. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames as well as boundary elements of special structural walls of concrete and shear reinforcement; continuous.
 - c. Shear reinforcement; continuous.
 - d. Other reinforcing steel; periodic.

3.02 SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION

- A. Reinforcing Steel, Including Prestressing of Tendons and Placement: Verify compliance with approved contract documents and ACI 318, Sections 3.5 and 7.1 through 7.7; periodic.
- B. Reinforcing Steel Welding: Verify compliance with AWS D1.4/D1.4M and ACI 318, Section 3.5.2; periodic.
- C. Design Mix: Verify plastic concrete complies with the design mix in approved contract documents and with ACI 318, Chapter 4 and 5.2; periodic.
- D. Specified Curing Temperature and Techniques: Verify compliance with approved contract documents and ACI 318, Sections 5.11 through 5.13; periodic.
- E. Concrete Strength in Situ: Verify concrete strength complies with approved contract documents and ACI 318, Section 6.2, for the following.
- F. Formwork Shape, Location and Dimensions: Verify compliance with approved contract documents and ACI 318, Section 6.1.1; periodic.

3.03 SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION

- A. Masonry Structures Subject to Special Inspection:
 - 1. Empirically designed masonry, glass unit masonry and masonry veneer in structures designated as "essential facilities".
 - 2. Engineered masonry in structures classified as "low hazard..." and "substantial hazard to human life in the event of failure".

- B. Verify each item below complies with approved contract documents and the applicable articles of ACI 530/530.1/ERTA.
1. Inspections and Approvals:
 - a. Verify compliance with the required inspection provisions of the approved contract documents; periodic.
 - b. Verify approval of submittals required by contract documents; periodic.
 2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction unless specifically exempted by code; periodic.
 3. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
 4. Joints and Accessories: When masonry construction begins, verify:
 - a. Proportions of site prepared mortar; periodic.
 - b. Construction of mortar joints; periodic.
 - c. Location of reinforcement, connectors, prestressing tendons, anchorages, etc; periodic.
 5. Structural Elements, Joints, Anchors, Protection: During masonry construction, verify:
 - a. Size and location of structural elements; periodic.
 - b. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; periodic.
 - c. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
 - d. Welding of reinforcing bars; continuous.
 6. Grouting Preparation: Prior to grouting, verify:
 - a. Grout space is clean; periodic.
 - b. Correct placement of reinforcing, connectors, prestressing tendons and anchorages; periodic.
 - c. Correctly proportioned site prepared grouts and prestressing grout for bonded tendons; periodic.
 - d. Correctly constructed mortar joints; periodic.
 7. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; periodic.
- C. Engineered Masonry in Buildings Designated as "Essential Facilities": Verify compliance of each item below with approved contract documents and the applicable articles of ACI 530/530.1/ERTA.
1. Inspections and Approvals:
 - a. Verify compliance with the required inspection provisions of the approved contract documents; periodic.
 - b. Verify approval of submittals required by contract documents; periodic.
 2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction and upon completion of each 5,000 square feet increment of masonry erected during construction; periodic.
 3. Preblended Mortar and Grout: Verify proportions of materials upon delivery to site; periodic.
 4. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
 5. Engineered Elements, Joints, Anchors, Grouting, Protection: Verify compliance of each item below with approved contract documents and referenced standards.
 - a. Proportions of site prepared mortar; periodic.
 - b. Placement of masonry units and construction of mortar joints; periodic.
 - c. Placement of reinforcement, connectors, prestressing tendons, anchorages, etc.; periodic.
 - d. Size and location of structural elements; periodic.
 - e. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; continuous.

- f. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
 - g. Welding of reinforcing bars; continuous.
6. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; continuous.

END OF SECTION 01 4533

SECTION 01 5000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes: administrative and procedural requirements for temporary services and facilities, including such items as temporary utility services, temporary construction and support facilities, and project security protection.
- B. Temporary Controls: Barriers, enclosures, and fencing.
- C. Security requirements.
- D. Waste removal facilities and services.

1.02 USE CHARGES

- A. Maintain utilities in Owner's name.
- B. No cost or usage charges for temporary services or facilities are chargeable to the Owner or Architect. Cost or use charges for temporary services or facilities will not be accepted as a basis of claims for a change order extra.

1.03 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES

- A. Provide adequate temporary facilities at each stage of construction. Provide a reasonably neat and uniform appearance in temporary construction and support facilities. Temporary construction and support facilities required for the project include but are not limited to the following:
 - 1. Temporary Heat: Provide temporary heat where needed for performance of the Work, curing or drying of recently installed work or protection of work in place from adverse effects of low temperatures or high humidity. Select facilities known to be safe and without deleterious effect upon the Work in place or being installed. Coordinate with ventilation requirements to maintain an appropriate minimum temperature in permanently enclosed portions of the building and areas where finished work has been installed. Provide temporary heating units that have been tested and labeled by UL, FM, or other recognized trade association related to the fuel being consumed. The permanent boiler equipment may be used after it has been completed. Use of the permanent heating equipment for construction purposes shall not alter or shorten the Owner's warranty in any way. If permanent equipment is used, all units and filters shall be cleared or replaced at substantial completion. Contractor shall pay cost of heat source until Substantial Completion.
 - 2. Field Offices: Provide temporary field office of sufficient size to accommodate required office personnel at the project site. Provide an insulated, weather-tight, lockable entrance, serviceable finishes, and mechanical and electrical equipment necessary to achieve ambient conditions necessary.
 - 3. Sanitary Facilities: Sanitary facilities include temporary toilets, wash facilities and drinking water fixtures. Comply with governing regulations including safety and health codes for the type, number, location, operation and maintenance of fixtures and facilities. Use of the Owner's permanent toilet facilities will not be permitted.
 - 4. Temporary Enclosures:
 - a. Provide temporary enclosure of materials, equipment, work in progress and completed portions of the Work to provide protection to the Work and employees from effects of exposure, foul weathers, other construction operations, and similar activities on the site. Provide temporary enclosures where temporary heat is needed and the permanent building enclosure is not yet completed.
 - b. Coordinate enclosures with ventilating and material drying or curing requirements to avoid dangerous conditions and effects. Keep excavations clear of water and provide temporary enclosures, grading and pumps necessary to insure this.
 - 5. Collection and Disposal of Wastes: Establish a system for daily collection and periodic disposal of waste materials from construction areas and elsewhere on the site. Schedule

collection so that collection containers do not overflow. Enforce requirements strictly. Dispose of waste material in a lawful manner. See Section 01 7419 – Construction Waste Management and Disposal.

6. Temporary Fire Protection: Develop and supervise an overall fire prevention, first-aid and fire protection program for personnel at the project site. Review needs with the local fire department officials and establish procedures to be followed. Instruct personnel in methods and procedures to be followed. Comply with the applicable recommendations of NFPA Standard 10 "Standard for Portable Fire Extinguishers". Locate fire extinguishers where they are most convenient and effective for their intended purpose. Store combustible materials in containers in recognize fire-safe locations. Post warnings and information and enforce strict discipline. Maintain unobstructed access to fire extinguishers, fire hydrants and other hazardous fire exposure area. Prohibit smoking in hazardous fire exposure areas. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of ignition for possible fires.
7. Barricades, Warning Lights and Signs: Appropriate signing and barricades shall be placed notifying the public of construction activities. Warning signs and barricades shall be in compliance with the Minnesota Manual on Uniform Traffic Control Devices. Roadway closing shall be coordinated with the City. Comply with recognized standards and code requirements for the erection of substantial, structurally adequate barricades where needed to prevent accidents and losses. Paint with appropriate colors, graphics and warning signs to inform personnel at the site and the public, of the hazard being protected against. Provide lighting, including flashing lights, where appropriate and needed.
8. Street and/or Sidewalk Cleaning: Provide as necessary.

1.04 TEMPORARY UTILITY SERVICES

Where the local utility company provides only a portion of the temporary utility, provide the remainder with matching, compatible materials and equipment. Comply with the utility company's recommendations. Use qualified workers for installation of temporary services and facilities. Locate temporary services and facilities where they will serve the entire project adequately and result in minimum interference with the performance of the Work. Relocate, modify and extend services and facilities as required during the course of work so as to accommodate the entire work of the project. Engage the local utility company to install temporary service to the project, or to make connections to existing service. Where necessary, arrange for an acceptable time when service can be interrupted to make connections for temporary services.

- A. Temporary utility services required for use at the project site may include but are not limited to the following:
 1. Water service and distribution: Install water service and distribution piping of sizes and pressures adequate for construction purposes during the construction period and until permanent service is in use. Pay water service use charges, whether metered or otherwise, for all water used by entities authorized to be at or to perform work at the project site.
 2. Temporary electric power and light: Provide a weatherproof, grounded temporary electric power service and distribution system of sufficient size, capacity and power characteristics to accommodate performance of work during the construction period. Whenever an overhead floor or roof deck has been installed, install temporary lighting adequate to provide sufficient illumination for safe work and traffic conditions in every area of work. Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service, including those requirements included in Division 26 sections. Allow for operation of security and protection requirements, without the necessity of operating the entire temporary lighting system. Protect lamps where fixtures are exposed to breakage by construction operations. Provide exterior fixtures where fixtures are exposed to the weather or moisture. Remove the temporary system when no longer needed.
 3. Telephone service: Arrange for the local telephone company to install temporary service to the project. At each telephone location post a list of important telephone numbers.

1.05 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING

- A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.07 SECURITY - SEE SECTION 01 3553

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.08 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.09 WINTER CONDITIONS

- A. Contractor shall allow for normal seasonal conditions in scheduling and estimating. The provision of heat, thawing, insulating and other activities typically required in the seasons, during which Construction will be performed, shall be included in the base price and shall not be separately billed to the Owner.

1.10 REGULATIONS

- A. Comply with requirements of local laws and regulations governing construction and local industry standards, in the installation and maintenance of temporary services and facilities. Regulations which must be complied with for the project include but are not limited to the following:
 - B. Building Codes including local requirements of permits, testing and inspection.
 - C. Health and safety regulations.
 - D. Utility company regulations and recommendations governing temporary utility services.
 - E. Police and Fire Department rules and recommendations.
 - F. Police and Rescue Squad recommendations.
 - G. Environmental protection regulations governing use of water and energy, and the control of dust, noise and other nuisances.
 - H. Stormwater and erosion control regulations.

1.11 STANDARDS

- A. Provide only materials and equipment that are recognized as being suitable for the intended use, by compliance with appropriate standards. Comply with the requirements of NFPA Code 241, "Building Construction and Demolition Operations", the ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and the NECA National Joint Guideline NJG-6 "Temporary Job Utilities and Services".

1.12 INSPECTIONS

- A. Arrange for required inspections and tests by governing authorities, and obtain required certifications and permits for use.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide each temporary service and facility ready for use at each location when the service or facility is first needed to avoid delay in performance of the Work. Maintain, expand as required and modify temporary services and facilities as needed throughout the progress of the Work.
- B. At the earliest feasible time, change over from the use of temporary utility service to the use of the permanent service, to enable removal of the temporary utility and to eliminate possible interference with completion of the Work.
- C. Operate and maintain temporary services and facilities in a safe and efficient manner. Do not overload temporarily services or facilities, and do not permit them to interfere with the progress of the Work. Do not allow unsanitary conditions, public nuisances or hazardous conditions to develop or persist on the site. Take necessary fire prevention measures. Maintain site security and protection facilities in a safe, lawful and publicly acceptable manner.

PART 3 EXECUTION

3.01 GENERAL

- A. Enforce strict discipline in use of temporary services and facilities at the site. Limit availability of temporary services and facilities to essential and intended uses to minimize waste and abuse. Do not allow hazardous, dangerous or unsanitary conditions to develop or persist on the project site. Maintain the operation of temporary enclosures, heating cooling, humidity control, ventilation and similar facilities as required to achieve indicated results in the Work and to avoid the possibility of damage to the Work or to temporary facilities.
- B. Remove each temporary service and facility promptly when the need for it has been replaced by the use of a permanent facility, or no later than substantial completion. Repair damaged work, clean exposed surfaces and replace work which cannot be satisfactorily repaired. At substantial completion, clean and renovate permanent services and facilities that have been used to provide temporary services and facilities during the construction period.

END OF SECTION 01 5000

SECTION 01 5713
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Obtain and comply with NPDES Permit.
- B. Implement SWPPP Plan for this project as prepared by the Owner's consultant.
- C. Implement "Best Management Practices" (BMP) to control stormwater, erosion and sedimentation.
- D. Restoration of any areas that exhibit erosion.
- E. Perform all inspection, maintenance and management during the project to comply with NPDES.
- F. Protect Owner from costs, fines, or assessment due to non-compliance by Contractor with laws, regulations, and controls.

1.02 RELATED REQUIREMENTS

- A. Section 31 0000 - EARTHWORK
- B. The Owner's Consultant will prepare the SWPPP.

1.03 REFERENCES

- A. Developing your Stormwater Pollution Prevention Plan, US Environmental Protection Agency.
- B. Minnesota Stormwater Manual, Minnesota Pollution Control Agency.

1.04 PERFORMANCE REQUIREMENTS

- A. Comply with all requirements of the U.S. Environmental Protection Agency and Minnesota Pollution Control Agency and _____ Watershed District for stormwater, erosion, and sedimentation control.
- B. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained.
- C. Install all controls required for compliance with permit:
 - 1. Best Management Practices (BMP) including silt fence, perimeter controls, soil stabilization, sediment controls, wash-out area, construction entrances, spill protection, storage areas, signage and other as required.
 - 2. Implement regular maintenance inspections and logging programs and document these as required.
 - 3. Maintain records on site.
 - 4. Provide education of employees for compliance with referenced standards.
- D. Perform all interim measures to comply with requirements including mulching and temporary seeding.
- E. Clean, maintain, repair and enhance all in-place controls during the project.
- F. Pay all fines and assessments levied during this project for non-compliance and reimburse Owner for all costs incurred by owner due to contractor non-compliance.
- G. Remove all temporary installations, install or repair all items that are to remain in place and file all required notices of termination at the end of the project.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Stormwater erosion and sedimentation control materials must comply with NPDES/MPCA and may include, but are not limited to:
 - 1. Mulch
 - 2. Grass Seed For Temporary Cover
 - 3. Straw Bales
 - 4. Bale Stakes
 - 5. Silt Fence Fabric
 - 6. Silt Fence Posts
 - 7. Gravel
 - 8. Riprap

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION

- A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES

- A. Provide specific measures for stormwater, erosion and sedimentation control as outlined in the performance requirements in this Section.

END OF SECTION 01 5713

SECTION 01 5721
INDOOR AIR QUALITY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Construction procedures to promote adequate indoor air quality after construction.
- B. Building flush-out after construction and before occupancy.
- C. Testing indoor air quality after completion of construction.

1.02 PROJECT GOALS

- A. Minimize dust and airborne particulates in HVAC ducts and equipment by protecting ducts and equipment from construction dust.
- B. Minimize airborne contaminants in project space by furnishing products meeting the specifications and avoiding construction practices that could result in contamination of installed products leading to indoor air pollution.

1.03 RELATED SECTIONS

- A. Section 01 9100 - Green Building Requirements.
- B. All sections as related to this Work.

1.04 REFERENCES

- A. American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc. (ASHRAE); 1791 Tullie Circle, NE, Atlanta, GA 30329. Tel: (404) 636-8400. Fax: (404) 321-5478.
- B. Bay Area Air Quality Management District (BAAQMD); 939 Ellis Street, San Francisco, CA 94129. Tel: (415) 771-6000. www.baaqmd.gov.
- C. Center for Resource Solutions (CRS); Presidio Building, 49 P.O. Box 29152, San Francisco, CA 94129. Tel: (415) 561-2100. Fax: (415) 561-2105. www.resource-solutions.org or www.green-e.org.
- D. Green Seal; 1001 Connecticut Avenue, NW, Suite 827, Washington, DC 20036-5525. Tel: (202) 872-6400. Fax: (202) 872-4324. www.greenseal.org.
- E. South Coast Air Quality Management District (SCAQMD); 21865 E. Copley Drive, Diamond Bar, CA 91765. Tel: (909) 396-2000. www.aqmd.gov.
- F. U.S. Green Building Council (USGBC) LEED® for Homes; 1015 18th Street, NW, Suite 805, Washington, DC 20036. Tel: (202) 82-USGBC or (202) 828-7422. Fax: (202) 828-5110. www.usgbc.org/leed/homes.
- G. Minnesota Green Communities Guidelines, www.greencommunitiesonline.org/minnesota.
- H. SMACNA (OCC) - IAQ Guidelines for Occupied Buildings Under Construction; 2007.

1.05 DEFINITIONS

- A. Adsorptive Materials: Gypsum board, acoustical ceiling tile and panels, carpet and carpet tile, fabrics, fibrous insulation, and other similar products.
- B. Contaminants: Gases, vapors, regulated pollutants, airborne mold and mildew, and the like, as specified.
- C. Particulates: Dust, dirt, and other airborne solid matter.
- D. Wet Work: Concrete, plaster, coatings, and other products that emit water vapor or volatile organic compounds during installation, drying, or curing.

1.06 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for submittal procedures.
- B. Interior Finishes Installation Schedule: Identify each interior finish that either generates odors, moisture, or vapors or is susceptible to adsorption of odors and vapors, and indicate air handling zone, sequence of application, and curing times.

C. Duct and Terminal Unit Inspection Report.

1.07 QUALITY ASSURANCE

A. Testing and Inspection Agency Qualifications: Independent testing agency having minimum of 5 years experience in performing the types of testing specified.

PART 2 PRODUCTS

2.01 MATERIALS

A. A. Low VOC Materials: See 01 4100 - Regulatory Requirements for specific requirements for materials with low VOC content.

PART 3 EXECUTION

3.01 CONSTRUCTION PROCEDURES

- A. Prevent the absorption of moisture and humidity by adsorptive materials by:
 - 1. Sequencing the delivery of such materials so that they are not present in the building until wet work is completed and dry.
 - 2. Delivery and storage of such materials in fully sealed moisture-impermeable packaging.
 - 3. Provide sufficient ventilation for drying within reasonable time frame.
- B. Begin construction ventilation when building is substantially enclosed.
- C. When working in a portion of an occupied building, prevent movement of air from construction area to occupied area.
- D. HVAC equipment and supply air ductwork may be used for ventilation during construction:
 - 1. Operate HVAC system on 100 percent outside air, with 1.5 air changes per hour, minimum.
 - 2. Ensure that air filters are correctly installed prior to starting use; replace filters when they lose efficiency.
 - 3. Do not use return air ductwork for ventilation.
 - 4. Seal return air inlets or otherwise positively isolate return air system to prevent recirculation of air; provide alternate return air pathways.
 - 5. Ensure that warranty for HVAC starts at date of substantial completion.
- E. Do not store construction materials or waste in mechanical or electrical rooms.
- F. Prior to use of return air ductwork without intake filters clean up and remove dust and debris generated by construction activities.
 - 1. Inspect duct intakes, return air grilles, and terminal units for dust.
 - 2. Clean plenum spaces (new and existing), including top sides of lay-in ceilings, outsides of ducts, tops of pipes and conduit.
 - 3. Clean tops of doors and frames.
 - 4. Clean mechanical and electrical rooms, including tops of pipes, ducts, and conduit, equipment, and supports.
 - 5. Clean return plenums of air handling units.
 - 6. Remove intake filters last, after cleaning is complete.
- G. Do not perform dusty or dirty work after starting use of return air ducts without intake filters.
- H. Use other relevant recommendations of SMACNA (OCC) for avoiding unnecessary contamination due to construction procedures.
- I. Maintain proper signage designating all interior areas as non-smoking and enforce.

END OF SECTION 01 5721

SECTION 01 6000
MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 TRANSPORTATION AND HANDLING

- A. All material shall be handled with care and proper measures taken to avoid damage to all materials. Damaged materials shall not be incorporated into the project. Unsuitable materials (soils, pavements, miscellaneous materials, etc.) which are removed and scheduled for disposal become the property of the Contractor and are to be hauled away and disposed.

1.02 STORAGE OF MATERIALS

- A. The Contractor shall store materials in a manner such as to protect them from the elements. Materials shall not be stored directly on the ground. Stored materials shall be covered to protect from wind damage or moisture damage. Do not deliver materials to the site until shortly before they are required. Deliver packaged products in their original, unopened containers.

1.03 SELECTIONS

- A. Colors and patterns of finished materials shall be selected by the Architect from the manufacturer's standard colors and patterns, unless otherwise specified.

1.04 QUALITY ASSURANCE

- A. Provide products of the same kind, from a single source.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 6000

**SECTION 01 7329
CUTTING AND PATCHING**

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. "Cutting and Patching" includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and patching required for restoring surfaces to their original condition. Additionally, "Cutting and Patching" is performed for coordination of the Work, to uncover work for access or inspection, to obtain samples for testing, to permit alterations to be performed or for other similar purposes. Each Contractor shall be responsible for executing their own cutting and patching necessary for the installation of their work.

1.02 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural work in a manner that would result in a reduction of load-carrying capacity or of load-deflection ratio.
- B. Operational and Safety Limitations: Do not cut and patch operational elements or safety related components in a manner that would result in: a reduction of their capacity to perform in the manner intended, increased maintenance, decreased operational life, or decreased safety.
- C. Visual Requirements: Do not cut and patch work in a manner that would, in the Architect's opinion, result in lessening the building's aesthetic qualities or in substantial visual evidence of cut and patch work. Remove and replace work judged by the Architect to be cut and patched in a visually unsatisfactory manner. If possible retain the original installer or fabricator, or another recognized experienced and specialized firm to cut and patch the work.
- D. Rated Assemblies: Do not cut and patch rated assemblies where possible. When cutting is required, patch in a manner approved by the Building Official to maintain the integrity and rating of the assembly.

PART 2 PRODUCTS

2.01 GENERAL

- A. Except as otherwise indicated, use materials for cutting and patching that are identical to existing materials. Use materials for cutting and patching that will result in equal-or-better performance characteristics.

PART 3 EXECUTION

3.01 INSPECTION AND COORDINATION

- A. Examine the surfaces to be cut and patched and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, take corrective action before proceeding with the Work.

3.02 TEMPORARY SUPPORT AND PROTECTION

- A. Provide temporary support of work to be cut as necessary. Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations.

3.03 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching work.
- B. Cutting: In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut through concrete and masonry using a cutting machine to insure a neat hole. Cut holes and slots neatly to size required with minimum disturbance to adjacent work. Avoid marring existing finished surfaces. Temporarily cover openings when not in use.
- C. Patching: Patch with seams that are durable and invisible.

END OF SECTION 01 7329

SECTION 01 7419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes required recycling and recovery of the following waste materials and applies to listed waste materials produced during the Work:
 - 1. Concrete and Masonry: Clean concrete, brick, rock and masonry.
 - 2. Metals: Metal scrap including iron, steel, copper, brass and aluminum.
 - 3. Untreated Wood: Unpainted, untreated dimensional lumber, timber beams, engineered wood products, plywood, oriented strand board, Masonite, particleboard, wood shipping pallets and crates.
 - 4. Gypsum Wallboard Scrap: Excess drywall construction materials including cuttings, other scrap and excess materials if local market is available.
 - 5. Paper and Cardboard: Discarded office refuse including unwanted files, correspondence, etc. Clean, corrugated cardboard used for packaging, etc.
- B. Non-Recyclable Waste: Collect and segregate non-recyclable waste for delivery to a permitted landfill site.
 - 1. Mixed, Solid Waste: Solid waste commonly collected as a municipal service, exclusive of waste materials listed above.

1.02 RELATED SECTIONS

- A. Section 01 2300 - Alternates.
- B. Section 01 9100 - Green Building Requirements.
- C. All Sections as related to work.

1.03 ALTERNATES

- A. **Alternate 2:** Reduce waste materials to the maximum extent possible with at least 25% of non-hazardous construction debris diverted from the landfill, and a goal of 75% of non-hazardous construction debris diverted from the landfill.

1.04 DEFINITIONS

- A. Recovery: Any process that reclaims materials, substances, energy, or other products contained within or derived from waste on-site. It includes waste-to-energy, composting and other processes.
- B. Recycling: The process of collecting and preparing recyclable materials and reusing them in their original form or in manufacturing processes that do not cause the destruction of recyclable materials in a manner that precludes further use.
- C. Waste Materials: Large and small pieces of listed materials which are excess to contract requirements and generally include materials to be recycled and/or recovered from existing construction and items of trimmings, cuttings and damaged goods resulting from new installations, which cannot be effectively used in the Work.

1.05 SUBMITTALS

- A. See Section 013323 - Shop Drawings, Product Data and Samples, for submittal procedures.
- B. Construction Waste Management Plan:
 - 1. Before start of construction, develop a construction waste management plan indicating how Contractor proposes to collect, segregate, recycle and recover construction wastes and debris generated by the Work.
 - 2. Include a list of recycling facilities to which indicated recyclable materials will be sent for recycling, or name of off-site waste recycling facility where waste will be sorted and recycled as specified.

3. Identify materials that are not recyclable or otherwise recoverable that must be disposed of in a landfill or other means acceptable under governing State of Minnesota and local regulations. List permitted landfills and/or other disposal means to be employed.

1.06 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable requirements of the State of Minnesota and applicable local ordinances and regulations concerning management of construction, demolition, land clearing, inert, and yard trash debris and subsequent modifications and amendments to same.
- B. Disposal Sites, Recyclers, and Waste Materials Processors: Use only facilities properly permitted by the State of Minnesota and by local authorities where applicable.
- C. Pre-Construction Waste Management Conference: Prior to beginning work at the site, schedule and conduct a conference to review the Construction Waste Management Plan and discuss procedures, schedules and specific requirements for waste materials recycling and disposal. Discuss coordination and interface between Contractor and other construction activities. Identify and resolve problems of compliance with requirements. Record minutes of the meeting, identifying conclusions reached and matters requiring further resolution. Maintain waste management as an agenda item at future construction meetings.
 1. Attendees: Contractor and related Contractor personnel associated with work of this section, including personnel in charge of the waste management program; Architect; material suppliers where appropriate, waste management subcontractor/vendor, and such additional Owner personnel as Owner deems appropriate.
 2. Plan Revision: Make revisions to Construction Waste Management Plan agreed upon during the meeting and incorporate resolutions agreed to be made subsequent to the meeting.
- D. Implementation: Designate an on-site party responsible for instructing workers and implementing Construction Waste Management Plan. Distribute copies of Construction Waste Management Plan to job site foreman and each subcontractor. Include waste management and recycling in worker orientation. Provide on-site instruction on appropriate separation, handling, recycling and recovery methods to be used by all parties at the appropriate stages of the work at the site. Include waste management and recycling discussion in pre-fabrication meetings with subcontractors and fabricators. Also include discussion of waste management and recycling in regular job meetings and job safety meetings conducted during the course of work at the site.

1.07 STORAGE AND HANDLING

- A. Site Storage: Remove materials for recycling and recovery from the work location to approved containers or storage areas as required.
- B. Position containers for recyclable and recoverable waste materials at a designated location on the Project Site. If materials are sorted on site, provide separate collection containers or storage areas for not less than the following materials:
 1. Concrete and masonry.
 2. Metals.
 3. Untreated lumber.
 4. Gypsum wallboard scrap.
 5. Paper and cardboard.
- C. Change-out loaded containers for empty containers as demand requires.
- D. Handling: Deposit indicated recyclable, and recoverable materials in storage areas or containers in a clean (no mud, adhesives, solvents, petroleum contamination), debris-free condition. Do not deposit contaminated materials.
- E. If the contamination chemically combines with the material so that it cannot be cleaned, do not deposit into the recycle containers.
- F. Maintain records of material recycling and disposal for review by Architect/Owner.

1.08 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Transport recyclable and recoverable waste materials from the Work Area to containers and carefully deposit in the containers without excess noise and interference with other activities, to minimize noise and dust.
 - 1. Do not place recyclable waste materials on the ground adjacent to a container.
- B. Existing Conditions: Coordinate with "Instructions to Bidders" and "Supplementary Conditions."

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT

- A. General: Implement waste management procedures in accordance with Construction Waste Management Plan. Maintain procedure throughout the life of this Contract.
- B. Source Separation On- or Off-Site: Either separate, store, protect, and handle at the project site all identified recyclable and recoverable waste products to prevent contamination of materials and maximize recyclability and recoverability of materials or mix all identified recyclable and recoverable waste products for separation off-site.
- C. Arrange for the regular collection, transport from the site, and delivery to respective approved recycling centers of indicated recyclable waste materials.
- D. Delivery Receipts: Arrange for timely pickups from the site or deliveries to approved recycling facilities of designated waste materials to keep construction site clear and prevent contamination of materials.

3.02 RECYCLABLE WASTE MATERIALS HANDLING

- A. General: The following paragraphs supplement handling requirements for various of the materials identified for classification and recycling listed in Part 1 "Summary" article above.
 - 1. Concrete and Masonry: Free of metals, woods and other contaminants. If possible during demolition, crush existing concrete and concrete masonry units on-site into aggregate size. Store crushed material on-site in clean area to avoid contamination from other materials or building processes. Reuse on-site crushed material for fill, for stabilizing soils, or as base and sub-base materials. If crushing on site is impractical, store material during demolition processes on site in clean, uncontaminated area. Transport concrete and masonry materials to a certified concrete recycler as needed.
 - 2. Metals: Cut items to lengths and sizes to fit within the container provided when necessary. Where there is sufficient quantity of a specific recyclable waste item (for example: salvaged metal roofing or duct work), make special arrangements for items to be bundled, banded or tied, and stack in a designated location for a special pick-up.
 - 3. Untreated Wood: Salvaged wood materials to be free of metals, concrete, gypsum wallboard, insulation, and other contaminating materials. Stack dimensional wood into like piles. For example, store 2 x 4s with other 2 x 4s, and 2 x 6s with other 2 x 6s. Also, if quantity is sufficient, separate piles into lengths of 4-foot increments. Reuse lumber on site as studs, backing, blocking or other uses where appropriate. Stack non-dimensional wood in piles for possible reuse on-site or transport off-site. Depending on size of lumber, recycle or chip wood for plant mulch. If wood materials cannot be used on site, transport to a certified wood recycler or reuse center.
 - 4. Gypsum Wallboard Scrap: Separate gypsum wallboard from other wastes. Dispose of waste gypsum wallboard off-site at a gypsum reclamation or recycling facility, or on-site as a soil amendment.
 - 5. Paper and Cardboard: Classify and handle waste paper goods as follows:
 - a. Cardboard and paperboard cartons and boxes: knock-down, fold flat, and deposit in appropriate recycle container.

END OF SECTION 01 7419

SECTION 01 7700
CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 PROJECT CLOSEOUT

- A. Project closeout is the term used to describe certain collective project requirements, indicating completion of the Work that are to be fulfilled near the end of the Contract time in preparation for final acceptance and occupancy of the Work by the Owner, as well as final payment to the Contractor and the normal termination of the Contract. Specific requirements for individual units of work are included in the appropriate sections in Division 2 through 35.

1.02 TIME OF CLOSEOUT

- A. Time of closeout is directly related to "Substantial Completion"; therefore, the time of closeout will be a single time period for the entire Work that is certified as substantially complete and for which final certification of occupancy has been issued by the City at different dates.

1.03 NOTIFICATION BY CONTRACTOR

- A. Contractor shall give written notice to the Owner 75 days prior to the time of Substantial Completion that the project will be occupiable by the Owner on the date of Substantial Completion. Owner shall be entitled to rely, or that written notice for purposes of leasing of units, securing insurance coverage, marketing and such other purposes related to Owner's use of the completed project.

1.04 PREREQUISITES TO SUBSTANTIAL COMPLETION

- A. General: Complete the following before requesting the Architect's inspection for certification of substantial completion. List known exceptions in the request.
1. Occupancy permits and similar approvals or certifications by governing authorities and franchised services, assuring Owner's full access and use of completed work.
 2. Warranties (guarantees), maintenance agreements and similar provisions of contract documents. All warranties shall start on the date of Substantial Completion.
 3. Test/adjust/balance records, maintenance instructions, start-up performance reports, and similar change-over information germane to Owner's occupancy, use, operation and maintenance of completed work.
 4. Application for reduction (if any) of retainage, and consent of surety.
 5. Advise to Owner on coordination of shifting insurance coverages, including proof of extended coverages as required.
 6. Listing of Contractor's incomplete work, recognized as exceptions to Architect's Certificate of Substantial Completion.
 7. Removal of temporary facilities, services, surplus materials, rubbish and similar elements.
- B. Progress Payment: In the progress payment request that coincides with, or is the first request following, the date substantial completion is claimed, show either 100% completion for the portion of the Work claimed as "substantially complete", or list incomplete items, the value of incomplete work, and reasons for the Work being incomplete.
- C. Submittals: Submit along with the progress payment, the following items:
1. Supporting documentation for completion as indicated in these contract documents.
 2. A statement showing an accounting of changes to the Contract Sum.
 3. Record drawings, maintenance manuals, and similar final record information.
- D. Work to be completed: Complete the items in order for the Work to be "substantially complete".
1. All primary building systems shall be essentially complete.
 2. Deliver tools, spare parts, and extra stock of material and similar physical items to the Owner.
 3. Make the final change-over of locks and transmit the keys to the Owner. Advise the Owner's personnel of the change-over in security provisions.
 4. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities and

services from the project site, along with construction tools and facilities, mock-ups, and similar elements.

5. Touch-up and otherwise repair and restore marred exposed finishes.
6. Do final cleaning.

1.05 INSPECTION FOR SUBSTANTIAL COMPLETION

- A. Upon receipt of the Contractor's request, the Architect will proceed with inspection. The Owner will also inspect the Work. The Contractor shall inspect all building areas for similar deficiencies or conditions noted by the architect for compliance with the contract. Following the inspection, the Architect will either prepare the certificate of substantial completion or will advise the Contractor of work which must be performed before the certificate will be issued. Contractor will submit a list of incomplete items with request.
- B. Issue of "Certificate of Substantial Completion": When the Work, in the Architect's judgment, has progressed to the point where only minor corrective actions are necessary and the final certificate of occupancy has been issued by the City, the Architect will issue a certificate of substantial completion. The certificate shall be AIA Document G704, Certificate of Substantial Completion, and latest edition. The certificate may include attached documents such as a "punch-list" for final acceptance, requirements of work that are incomplete and of obligations that have not been fulfilled but are required for final acceptance. Failure to include items on such lists does not alter the responsibility of the Contractor to complete all work in accordance with the contract documents.

1.06 PREREQUISITES TO FINAL ACCEPTANCE

- A. Procedures: Complete the following before requesting the Architect's certification of final acceptance and final payment as required by the General Conditions. List known exceptions, if any, in the request.
 1. Remove temporary protection devices and facilities.
 2. Submit the final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 3. Submit a copy of the Architect's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.
 4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 5. Submit final meter reading for utilities and similar data either as of the date of substantial completion or else when the Owner took possession of and responsibility for corresponding elements of the Work.
 6. Submit assurance, satisfactory to Owner that unsettled claims will be settled and that work not actually completed and accepted will be completed without undue delay.
 7. Submit proof, satisfactory to Owner, that taxes, fees and similar obligations of Contractor have been paid. (AIA document G706 and 706A)
 8. Changeover of door locks and other Contractor's access provisions to Owner's property.
 9. Submit lien waivers from Contractor, Subcontractors and material suppliers in the full amount of the contract.
 10. Turn over as-built record documents.
 11. Contractor shall satisfy requirements for site area restoration, street maintenance and repair.

1.07 RECORD DOCUMENT SUBMITTALS

- A. Requirements for record documents are indicated in the individual sections of these specifications as well as in the General Conditions.
- B. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's reference during normal working hours.

- C. Record Drawings:
 - 1. The Contractor shall maintain a record set of reproducible copies of the Contract Drawings and shop drawings in a clean, undamaged condition. Mark-up the set of record documents to show the actual installation where the installed work varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing the actual "field" condition fully and accurately; however, where shop drawings are used for mark-up, record a cross-reference at the corresponding location on the working drawings. Give particular attention to concealed work that would be difficult to measure and record at a later date.
 - 2. Provide two sets in hardcopy and DVD format to the Owner upon completion.
- D. Record Specifications:
 - 1. Maintain one complete copy of the Project Manual, including specifications and addenda, and one copy of other written construction documents such as change orders and similar modifications issued in printed form during construction. Mark these documents to show substantial variations in the actual work performed in comparison with the text of the specifications and modifications as issued. Give particular attention to substitutions, selection of options and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable.
 - 2. Provide two sets in hardcopy and DVD format to the Owner upon completion.
- E. Record Product Data:
 - 1. Maintain one copy of each product data submittal. Mark these documents to show significant variations in the actual work performed in comparison with the submitted information. Include both variations in the products as delivered to the site and variations from the manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up of record drawings and specifications.
 - 2. Provide two sets in hardcopy and DVD format to the Owner upon completion.
- F. Maintenance Manuals:
 - 1. Provide two sets in hardcopy and DVD format to the Owner upon completion.
 - 2. Organize operating and maintenance data into suitable sets of manageable size. Bind data into individual binders properly identified and indexed. Bind each set of data in a heavy-duty, 3-ring vinyl-covered binder, with pocket folders for folded sheet information. Mark the appropriate identification on both front and spine of each binder. Include the following types of information in operation and maintenance manuals:
 - a. Emergency instructions.
 - b. Spare parts listing.
 - c. Copies of warranties.
 - d. Shop drawings and product data

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL OPERATING AND MAINTENANCE INSTRUCTION

- A. Arrange for each installer of operating equipment and other work that requires regular or continuing maintenance, to meet at the site with the Owner's personnel to provide necessary basic instruction in the proper operation and maintenance of the entire Work.
- B. Where installers are not experienced in the required procedures, include instruction by the manufacturer's representatives.
- C. Provide two DVD copies of equipment and system instructional videos.

3.02 REMOVAL OF TEMPORARY PROTECTION DEVICES AND FACILITIES

- A. Except as otherwise indicated or requested by the Architect, remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work during the remainder of the construction period.

3.03 FINAL CLEANING

- A. Special cleaning requirements for specific units of Work are included in the appropriate sections of Division 02-14. General Cleaning during the regular progress of the Work is required by the General Conditions and is included under Section 01 5000 - Temporary Facilities and Controls.
- B. Final Cleaning: Employ experienced workers or professional cleaners for final cleaning. Comply with the manufacturer's instruction for operations. Complete the following cleaning operations before requesting the Architect's inspection for certification of final completion.
 - 1. Remove labels which are not required as permanent labels.
 - 2. Clean transparent materials, including mirrors and glass in doors and windows, to a polished condition.
 - 3. Clean exposed exterior and interior hard-surfaced finishes free of dust, stains, films and similar noticeable distracting substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces. Glass to be cleaned. Hardware to be polished.
 - 4. Wipe surfaces of mechanical and electrical equipment clean. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - 5. Clean the project site of rubbish, litter and other foreign substances. Sweep paved areas to a broom clean condition; remove stains, spills and other foreign deposits.
 - 6. Mechanical rooms and other unfinished spaces to be "broom clean".
 - 7. Mechanical equipment shall be dusted and cleaned. Plumbing fixtures to be sterilized. Filters and ductwork are to be cleaned.
 - 8. Electrical fixtures are to be cleaned and burned out lamps replaced.
 - 9. At resilient flooring, strip and provide three (3) coats of wax, buff, and provide two (2) additional coats of wax and final buff.

3.04 COMPLIANCE

- A. Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at the site. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile or other harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

3.05 OVERRUN STOCK

- A. Where extra materials of value remaining after completion of associated work have become the Owner's property, dispose of these materials as directed by Owner.
- B. Leave attic stock where directed by Owner and as specified in selected Sections.

END OF SECTION 01 7700

**SECTION 02 4100
DEMOLITION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Building demolition excluding removal of hazardous materials and toxic substances.
- B. Selective demolition of building elements for alteration purposes.
 - 1. Includes cutting of steel plate and other steel components.

1.02 RELATED REQUIREMENTS

- A. Section 00 3100 - Available Project Information: Existing building survey conducted by Owner; information about known hazardous materials.
- B. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- C. Section 01 5713 - Temporary Erosion and Sediment Control.
- D. Section 01 7419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.
- E. Section 31 0000 - Earthwork: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

1.05 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: Company specializing in the type of work required.
 - 1. Minimum of five years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Fill Material: As specified in Section 31 0000 - Earthwork.

PART 3 EXECUTION

3.01 SCOPE

- A. Remove buildings or portions of buildings as indicated on drawings. Salvage historic materials as indicated on drawings. Materials to be salvaged include but are not limited to:
 - 1. Exterior stone cladding.
 - 2. Interior wood millwork.
 - 3. Interior wood doors.
- B. Remove paving and curbs as required to accomplish new work.
- C. Remove all other paving and curbs as indicated on drawings.
- D. Outside area of new building construction, remove foundation walls and footings to a minimum of 3 feet below finished grade.
- E. Remove concrete slabs on grade as indicated on drawings.
- F. Remove manholes and manhole covers, curb inlets and catch basins.
- G. Remove fences and gates.
- H. Remove creosote-treated wood utility poles.
- I. Remove other items indicated, for salvage, relocation, and recycling.

- J. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as required so that required rough grade elevations do not subside within one year after completion.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.
 - 4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
 - 5. Provide, erect, and maintain temporary barriers and security devices.
 - 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 - 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 8. Do not close or obstruct roadways or sidewalks without permit.
 - 9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
 - 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Do not begin removal until built elements to be salvaged or relocated have been removed.
- D. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
- E. Protect existing structures and other elements that are not to be removed.
 - 1. Provide bracing and shoring.
 - 2. Prevent movement or settlement of adjacent structures.
 - 3. Stop work immediately if adjacent structures appear to be in danger.
- F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
- H. Perform demolition in a manner that maximizes salvage and recycling of materials.
 - 1. Dismantle existing construction and separate materials.
 - 2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
- I. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

- C. Remove existing work as indicated and as required to accomplish new work.
 - 1. Cut steel componets where indicated on drawings. Dispose of steel components that are not to be reused and/or installed elsewhere in the project.
 - 2. Remove items indicated on drawings.
 - 3. Salvage historic components for reuse as indicated above and on drawings.
- D. Services (Including but not limited to HVAC, Plumbing, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
 - 1. Verify that abandoned services serve only abandoned facilities before removal.
 - 2. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.
- E. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
 - 4. Patch as specified for patching new work.

3.04 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
- B. Remove from site all materials not to be reused on site; compy with Section 01 7419 Construction Waste Management and Disposal.
- C. Remove from site all materials not to be reused on site.
- D. Leave site in clean condition, ready for subsequent work.
- E. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 4100

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Concrete for composite floor construction.
- C. Concrete footings and foundation walls.
- D. Floors and slabs on grade.
- E. Concrete reinforcement.
- F. Joint devices associated with concrete work.
- G. Miscellaneous concrete elements, including equipment pads and light pole bases.
- H. Concrete topping.
- I. Concrete curing.
- J. Geofoam.

1.02 RELATED SECTIONS

- A. Section 01 4000 - Quality Requirements.
- B. Section 03 3511 - Concrete Floor Finishes: Densifiers, hardeners, applied coatings, and polishing.
- C. Section 05 5100 - Metal Stairs: Metal pans that require concrete.
- D. Section 07 2500 - Weather Barriers.
- E. Section 07 9005 - Joint Sealers: Sealants for saw cut joints and isolation joints in slabs.

1.03 REFERENCE STANDARDS

- A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010.
- B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- C. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).
- D. ACI 302.1R - Guide for Concrete Floor and Slab Construction; 2004 (Errata 2007).
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.
- F. ACI 305R - Hot Weather Concreting; 2010.
- G. ACI 306R - Cold Weather Concreting; 2010.
- H. ACI 308R - Guide to Curing Concrete; 2001 (Reapproved 2008).
- I. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.
- J. ACI 347R - Guide to Formwork for Concrete; 2014.
- K. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
- L. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
- M. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.
- N. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
- O. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2012.
- P. ASTM C150/C150M - Standard Specification for Portland Cement; 2015.
- Q. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2007.

- R. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.
- S. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- T. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- U. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.
- V. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.
- W. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.
- X. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.
- Y. ASTM C1116 - Standard Specification for Fiber-Reinforcing Concrete and Shotcrete.
- Z. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- AA. ASTM D6817.D6817M - Standard Specification for Rigid, Cellular Polystyrene Geofoam; 2017.
- AB. COE CRD-C 572 - Corps of Engineers Specifications for Polyvinylchloride Waterstop; 1974.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
- C. Mix Design: Submit proposed concrete mix design.
 - 1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
 - 2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
- D. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
- E. Test Reports: Submit report for each test or series of tests specified.
- F. See Section 01 4500 - Quality Control for field quality control reports and test results for review and approval of Architect.
- G. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

1.06 PRE-INSTALLATION MEETING

- A. Conduct pre-installation meeting with manufacturer's representative, Owner, Architect, building official (invited) and other necessary parties to verify product requirements, substrate conditions, manufacturer's installation instructions, manufacturer's warranty requirements, and job-specific conditions as indicated in documents.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 - 2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches of concrete surface.

2.02 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M Grade 60 (420).
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
- B. Fiber Reinforcement
 - 1. Synthetic Fiber: fibrillated polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.
- C. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gage.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
 - 3. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C 150, Type I - Normal portland type unless submitted for approval.
- B. Fine and Coarse Aggregates: ASTM C 33.
- C. Fly Ash: ASTM C618, Class C or F.
- D. Water: Clean and not detrimental to concrete.
- E. Fiber Reinforcement: Synthetic fiber shown to have long-term resistance to deterioration when exposed to moisture and alkalis; 1/2 inch length, unless submitted for approval.

2.04 CHEMICAL ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C 260. 6% +/- 1% Air Entrainment required for concrete exposed to freeze-thaw conditions. 4% +/- 1% for concrete not exposed to freeze-thaw conditions.

2.05 ACCESSORY MATERIALS

- A. Under-Slab Vapor Retarder: See Section 07 2500 - Weather Barriers.
- B. Moisture-Retaining Cover: ASTM C171; regular curing paper, white curing paper, clear polyethylene, white polyethylene, or white burlap-polyethylene sheet.
- C. Liquid Curing Compound: ASTM C 309, Type 1, clear or translucent, Class A. One of the following products is acceptable:
 - 1. Kurez DR VOX; The Euclid Chemical Company.
 - 2. L & M Cure; L&M Construction Chemicals, Inc.
 - 3. With approval products by one of the following manufacturers; Sonneborn, W.R. Grace, North Central, or Brock White.
- D. Fiber Reinforcing: ASTM C1116; mono-filament polypropylene or polyethylene macro-fiber.

2.06 BONDING AND JOINTING PRODUCTS

- A. Waterstops: PVC, complying with COE CRD-C 572.
- B. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
 - 1. Material: ASTM D1751, cellulose fiber.
 - 2. Manufacturers:
 - a. Homasote Company; Homex 300 with plastic edge caps: www.homasote.com.
 - b. Nomaco, Inc; Nomaflex Expansion Joint Filler with Void Cap Option: www.nomaco.com/#sle.
 - c. W. R. Meadows, Inc; Fiber Expansion Joint Filler with Snap-Cap: www.wrmeadows.com/#sle.
- C. Geofoam: Expanded polystyrene blocks complying with ASTM D6817.
 - 1. ASTM D6817 Compliance, Type: EPS15.
 - 2. Minimum Density: 0.90 lbs/cu.ft.
 - 3. Compressive Resistance at 1% deformation, min.: 520 psf.
 - 4. Elastic Modulus, min.: 360 psi.
 - 5. Flexural Strength, min.: 25.0 psi.
 - 6. Water Absorption by total immersion, max. percentage of volume: 4.0%.
 - 7. Oxygen Index, min. percentage of volume: 24%
 - 8. Buoyancy Force: 61.5 lbs.cu.ft.

2.07 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
- D. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.
- E. Normal Weight Concrete:
 - 1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
 - 2. Fly Ash Content: Minimum 25 percent of cementitious materials by weight.
 - 3. Water-Cement Ratio: Maximum 40 percent by weight, unless submitted for approval.
 - 4. Total Air Content: As indicated on structural drawings.
 - 5. Slump: As indicated on structural drawings.

2.08 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M.
- B. On-Project Site: Not allowed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Verify that forms are clean and free of rust before applying release agent.

- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- F. Install vapor retarder directly under interior slabs on grade as per Section 07 2500 - Weather Barriers.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Install reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Architect not less than 24 hours prior to commencement of placement operations.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Ensure reinforcement, inserts, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- G. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

- A. Locate joints as indicated on drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
 - 1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- D. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal with manufacturer's recommended watertight tape.
- E. Separate slabs on grade from vertical surfaces with joint filler.
- F. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- G. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07 9005 - Joint Sealers for finish joint sealer requirements.
- H. Install joint devices in accordance with manufacturer's instructions.
- I. Apply sealants in joint devices in accordance with Section 07 9005 - Joint Sealers.

- J. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- K. Place concrete continuously between predetermined expansion, control, and construction joints.
- L. Do not interrupt successive placement; do not permit cold joints to occur.
- M. Place floor slabs in saw cut pattern indicated.
- N. Saw cut joints within 24 hours after placing. Use 3/16 inch thick blade, cut into 1/3 depth of slab thickness.
- O. Screed floors level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. Maximum Variation of Surface Flatness:
 - 1. Exposed Concrete Floors: 1/4 inch in 10 ft.
 - 2. Under Seamless Resilient Flooring: 1/4 inch in 10 ft.
 - 3. Under Carpeting: 1/4 inch in 10 ft.
- B. Correct the slab surface if tolerances are less than specified.
- C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off any smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and terrazzo with full bed setting system.
 - 2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 301.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
 - 3. Wall Surfaces to Be Left Exposed Including Foundation Walls: Rubbed surface minimizing burnish marks and other appearance defects.
- E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

3.08 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than 7 days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
 - 1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.

2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 3. Final Curing: Begin after initial curing but before surface is dry.
 - a. Moisture-Retaining Cover: Seal in place with waterproof tape or adhesive.
 - b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.
- E. Verify curing method compatibility with final floor finish.

3.09 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to SER for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- E. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.10 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

3.12 SCHEDULE - CONCRETE TYPES AND FINISHES

- A. Interior Floor Slabs: Trowel finish as noted above for finish slab.
- B. Interior Walls: Form finish.

END OF SECTION 03 3000

SECTION 03 3511
CONCRETE FLOOR FINISHES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface treatments for concrete floors and slabs.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.
- B. Section 03 3000 - Cast-in-Place Concrete: Curing compounds that also function as sealers.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with concrete floor placement and concrete floor curing.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples, for submittal procedures.
- B. Product Data: Manufacturer's published data on each finishing product, including information on compatibility of different products and limitations.
- C. Maintenance Data: Provide data on maintenance and renewal of applied finishes.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's sealed packaging, including application instructions.

1.06 FIELD CONDITIONS

- A. Maintain light level equivalent to a minimum 200 W light source at 8 feet above the floor surface over each 20 foot square area of floor being finished.
- B. Maintain ambient temperature of 50 degrees F minimum.

PART 2 PRODUCTS

2.01 CONCRETE FLOOR FINISH APPLICATIONS

- A. Liquid Densifier/Hardener:
 - 1. Use at following locations: Where indicated on drawings.
- B. Penetrating Clear Sealer:
 - 1. Use at following locations: Where indicated on drawings.
- C. High Gloss Clear Sealer:
 - 1. Use at following locations: Where indicated on drawings.

2.02 DENSIFIERS AND HARDENERS

- A. Liquid Densifier/Hardener: Penetrating chemical compound that reacts with concrete, filling the pores and dustproofing; for application to concrete after set.
 - 1. Composition: Sodium silicate.

2.03 COATINGS

- A. High Gloss Clear Sealer: Transparent, non-yellowing, water- or solvent-based coating.
 - 1. Composition: Acrylic polymer-based.
 - 2. Nonvolatile Content: 40 percent, minimum, when measured by volume.
 - 3. Products:
 - a. W.R. Meadows, Inc; Deck-O-Grip W/B (slip-resistant): www.wrmeadows.com/#sle.
 - b. Substitutions: See Section 01 2513 - Product Substitution Procedures.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that floor surfaces are acceptable to receive the work of this section.

- B. Verify that flaws in concrete have been patched and joints filled with methods and materials suitable for further finishes.

3.02 GENERAL

- A. Apply materials in accordance with manufacturer's instructions.

3.03 COATING APPLICATION

- A. Verify that surface is free of previous coatings, sealers, curing compounds, water repellents, laitance, efflorescence, fats, oils, grease, wax, soluble salts, residues from cleaning agents, and other impediments to adhesion.
- B. Protect adjacent non-coated areas from drips, overflow, and overspray; immediately remove excess material.
- C. Apply coatings in accordance with manufacturer's instructions, matching approved mock-ups for color, special effects, sealing and workmanship.

END OF SECTION 03 3511

SECTION 03 5400
SELF-LEVELING UNDERLAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Liquid-applied self-leveling floor underlayment.
 - 1. Use gypsum-based type at areas indicated on drawings.
- B. Sound isolation barrier mat.
- C. Sound isolation perimeter barrier strip.
- D. Gypsum underlayment wear layer.

1.02 RELATED SECTIONS

- A. Section 01 2300 - Alternates.
- B. Section 06 1000 - Rough Carpentry: Substrate for underlayment.
- C. Section 06 1000 - Rough Carpentry: Components that are part of fire rated and sound rated assemblies.
- D. Section 09 2116 - Gypsum Board Assemblies: Components that are part of fire rated and sound rated assemblies.
- E. Section 09 65 00 - Resilient Flooring.

1.03 ALTERNATES:

- A. Refer to Section 01 2300 - Alternates for product alternatives affecting this Section.
- B. **Alternate 2:** Provide and install vinyl composition floor tile in lieu of gypsum underlayment wear layer.

1.04 REFERENCE STANDARDS

- A. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2014).
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets documenting physical characteristics and product limitations of underlayment materials. Include information on surface preparation.
- C. Certificate: Certify that products meet or exceed specified requirements.
- D. Field quality control reports and test results for review and approval.
- E. Manufacturer's Warranty.

1.06 SYSTEM DESCRIPTION

- A. Performance Requirements:
 - 1. Sound Control System: All floors separating residential units from each other and other non-residential areas; conform to referenced tested assemblies listed on the drawings with minimum STC of 50 and IIC of 50.

1.07 QUALITY ASSURANCE

- A. Installer's Qualifications: Installation of gypsum underlayment shall be by installer using manufacturers approved mixing and pumping equipment.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum five years of experience.

- C. Pre-installation Meeting; Conduct pre-installation meeting with manufacturer's representative, owner, architect, building official (invited), and other necessary parties to verify project requirements, substrate conditions, manufacturer's installation instructions, manufacturer's warranty requirements, and job-specific conditions as indicated in documents.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 100 degrees F.

1.09 MOCK-UP

- A. Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Prepare mock-up in location designated by Architect.
 - 2. Area: 6 ft by 6 ft.
 - 3. Do not proceed with underlayment work until workmanship of mock-up has been approved by Architect.
- B. Mock-up may remain as part of the Work.

1.10 FIELD CONDITIONS

- A. Do not install underlayment until floor penetrations and peripheral work are complete.
- B. Before, during, and after installation, building interior shall be enclosed and maintained at a temperature above 50 degrees F and below 100 degrees F until structure and subfloor temperature are stabilized.
- C. During the curing process, ventilate spaces to remove excess moisture.

1.11 SCHEDULING

- A. Scheduling: Application of underlayment shall not begin until the building is enclosed, including roof, windows, doors and other fenestration. Schedule application of underlayment after installation of gypsum board work.

1.12 PRE-INSTALLATION MEETING

- A. Conduct pre-installation meeting with manufacturer's representative, Owner, Architect, building official (invited) and other necessary parties to verify product requirements, substrate conditions, manufacturer's installation instructions, manufacturer's warranty requirements, and job-specific conditions as indicated in documents.

1.13 WARRANTY

- A. Provide manufacturer's warranty that underlayment is free of manufacturing defects and underlayment has been prepared and applied according to approved specified methods and that underlayment will attain minimum physical specifications specified. Manufacturer will replace all defective materials or workmanship under the terms of this warranty.
 - 1. Workmanship and completed operations five-year warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Maxxon Corp.; www.maxxon.com.
 - 2. USG; www.usg.com.
 - 3. Hacker Industries; www.hackerindustries.com.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 MATERIALS

- A. Gypsum Cement Underlayment:
 - 1. Maxxon; Product: Maxxon Gyp-Crete 2000/3.2K.
 - 2. Acoustical Barrier Mat:

- a. Maxxon; Product: Acousti-Mat II.
- 3. Perimeter Isolation Mat:
 - a. Maxxon Product: Enkasonic Perimeter ISO.
- 4. Water:
 - a. Potable and not detrimental to underlayment mix materials.
- 5. Subfloor Primer:
 - a. As recommended by underlayment manufacturer.
- 6. Joint and Crack Filler:
 - a. Latex based filler, as recommended by manufacturer.
- B. Gypsum-Based Underlayment: Gypsum-based mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
 - 1. Density: Maximum 115 pounds per cubic foot.
 - 2. Final Set Time: 1 to 2 hours, maximum.
 - 3. Thickness: 1 inch to maximum 2 inch.
 - 4. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.
- C. Gypsum-Based Self-Leveling Topping: Polymer-modified, gypsum-based mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling smoothing topping with the following properties:
 - 1. Compressive Strength: Minimum 4,500 pounds per square inch after 28 days, tested per modified ASTM C109.
 - 2. Final Set Time: 4 hours, maximum.
 - 3. Thickness: 1/4 inch.
 - 4. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.
- D. Acoustical Barrier Mat: Acoustimat II.
- E. Perimeter Isolation Mat: Enkasonic Perimeter ISO.
- F. Water: Potable and not detrimental to underlayment mix materials.
- G. Subfloor Primer: As recommended by manufacturer.
- H. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.
- I. Gypsum underlayment wear layer: Maxxon Fortify Primer:
 - 1. Maxxon Corporation; Fortify Primer: www.maxxon.com/#sle.
 - 2. Application: Four coats over self-leveling gypsum underlayment.

2.03 MIXING

- A. Site mix materials in accordance with manufacturer's instructions.
 - 1. Mix to achieve following characteristics:
 - a. All Flooring Areas: Ceramic tile, resilient flooring, direct-glue carpet, carpet with pad, etc.: minimum 3200 psi in accordance with ASTM C 472.
 - b. Resilient Flooring Areas: Minimum 3200 psi in accordance with ASTM C 472.
- B. Mix to self-leveling consistency without over-watering.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Condition and Cleaning of Subfloor: Subfloor shall be structurally sound. General Contractor shall clean subfloor to remove mud, oil, grease, and other contaminating factors before the arrival of underlayment crew.
- B. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.
- C. Verify that floor framing and subfloor are installed in accordance with materials and installation specified in Section 06 1000 - Rough Carpentry prior to beginning installation of underlayment.

Report all deficiencies to Architect and do not proceed until all conditions have been satisfactorily remedied.

- D. Application of gypsum cement underlayment shall not begin until the building is enclosed, including roof, windows, doors and other fenestration. Install after drywall installation unless tenant finish requirements identify partitioning after the pour. If underlayment is to be installed before drywall, then 3.4 lb./sq. yd. galvanized metal lath must be loose laid over the entire acoustical barrier mat surface. Schedule the acoustical barrier mat installation as late as possible in the construction cycle.

3.02 PREPARATION

- A. Leak Prevention: Fill cracks and voids with a quick setting patching or caulking material where leakage of underlayment could occur.
- B. Priming Subfloor: Prime the subfloor or acoustical mats using the manufacturer's Floor Primer. Priming instructions may vary according to the type of substrate, multiple coats may be necessary.
- C. Expansion Joints: Allow joints to continue through the Underlayment at the same width.
- D. Concrete: Mechanically prepare steel troweled concrete to create a textured surface necessary to achieve the best bond; acceptable methods include bead blasting and scarifying. Do not use acid etching.
- E. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.
- F. Vacuum clean surfaces. Subfloor shall be structurally sound. General Contractor shall clean subfloor to remove mud, oil, grease, and other contaminating factors before the arrival of the underlayment crew.
- G. Prime substrate in accordance with manufacturer's instructions. Prime the subfloor using the manufacturer's required primer for substrate and underlayment. Priming instructions may vary according to the porosity of the substrate, multiple coats may be necessary over porous plank or concrete. Allow to dry prior to installing underlayment.
- H. Prime all areas that receive glue down floor goods according to the manufacturer's specifications. Any floor areas where the surface has been damaged or dusting shall be cleaned and primed regardless of floor covering to be used. Where floor goods manufacturers require special adhesive or installation systems, their requirements supercede these recommendations.

3.03 ACOUSTICAL BARRIER AND PERIMETER ISOLATION MAT INSTALLATION

- A. Install sound mat following manufacturer's recommendations and specifications.
- B. Enkasonic Perimeter ISO Installation: Install Perimeter ISO following manufacturer's recommendations and specifications.

3.04 UNDERLAYMENT AND FLOOR TOPPING APPLICATION

- A. Install underlayment and floor topping in accordance with manufacturer's instructions.
- B. Pump or pour material onto substrate. Do not retemper or add water.
 - 1. Pump, move, and screed while the material is still highly flowable.
 - 2. Be careful not to create cold joints.
 - 3. Wear spiked shoes while working in the wet material to avoid leaving marks.
- C. Place underlayment to indicated thickness, with top surface level to 1/8 inch in 10 ft.
- D. Where installed prime acoustical barrier mat using the manufacturer's recommended floor primer to bond the underlayment to the mat.
- E. Floor Assemblies above and below Living Units: Gypsum underlayment with acoustical barrier and perimeter isolation mats at corridor walls, unit separation walls and other walls separating residential units from other areas of the building. Place a minimum of 1" thickness of gypsum underlayment over acoustical barrier mat.

- F. Elevation of continuous cured underlayment where installed over acoustical barrier and directly to structural substrate shall be the same.

3.05 CURING

- A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.
- B. Air cure in accordance with manufacturer's instructions.
- C. Provide continuous ventilation and adequate heat to rapidly remove moisture from the area until the underlayment product is dry. Contractor shall provide mechanical ventilation, if necessary. Maintain 55 degrees Fahrenheit temperature minimum for no less than seven consecutive days after placing material. Under the above conditions, for 3/4" thick gypsum underlayment 5-7 days is usually adequate drying time. To test for dryness, tape a 24" by 24" section of plastic to the surface of the underlayment. After 48-72 hours, if no condensation occurs, the underlayment shall be considered dry. Perform dryness test 5-7 days after pour.
- D. Dryness Test: Underlayment must be tested for dryness prior to the floor topping application. Use either a Delmhorst G-79 or B D 2100 moisture meter for gypsum concrete. The moisture reading must be 5% or less. A relative humidity meter or probe can be used.

3.06 GYPSUM UNDERLAYMENT WEAR LAYER

- A. Apply four coats of Fortify Primer over self-leveling underlayment layer per manufacturer's instructions.

3.07 PREPARATION FOR APPLIED FLOORING

- A. Floor Goods Procedures: Comply with requirements of manufacturer's specifications for installing finished floor goods.
- B. Resilient Floor Areas: Install flooring preparation sealer in accordance with manufacturer's requirements.

3.08 APPLICATION TOLERANCE

- A. Top Surface: Level to 1/8 inch in 10 ft.

3.09 FIELD QUALITY CONTROL

- A. Slump Test: Underlayment mix shall be tested for slump as its being pumped using a 2" by 4" cylinder resulting in a patty size of 8" plus or minus 1" diameter.
- B. At least one set of three molded cube samples shall be taken from each day's pour during the underlayment product application. Cubes shall be tested in accordance with ASTM C472. At least one set of three molded cube samples shall be taken from each day's pour during the floor topping application. Cubes shall be tested in accordance with ASTM C109. Test results shall be available to Architect and/or Contractor upon request from applicator.
- C. Placed Material: Contractor shall inspect and test for conformance to specification requirements.
- D. Manufacturer's representative is to conduct a site walk-through inspection and approval of areas to receive underlayment prior to the application. In addition the representative is to verify that moisture readings have been taken and documented, molded cube samples for testing have been taken and that underlayment has been applied according to manufacturer's recommendations and as specified, including the preparation for specified flooring coverages. Manufacturer's representative is to prepare and submit written field quality control reports documenting each of the above activities, deficiencies, and corrective actions taken.

3.10 PROTECTION

- A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.
- B. Do not permit traffic over unprotected floor underlayment surfaces.

- C. During construction, the General Contractor shall place temporary wood planking over underlayment products wherever it will be subject to heavy wheeled or concentrated loads.

END OF SECTION 03 5400

**SECTION 04 0100
MAINTENANCE OF MASONRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water and Chemical cleaning of stone masonry surfaces.
- B. Replacement of stone units.
- C. Paint removal from masonry surfaces.

1.02 RELATED SECTIONS

- A. Section 04 4200 - Stone Cladding.

1.03 REFERENCE STANDARDS

- A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; 2011.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples, for submittal procedures.
- B. Shop Drawings: Indicate setting details of stone. Detail temporary or permanent support.
- C. Product Data: Provide data on cleaning solutions; Repointing mortar, Lead "T" cap; Stone patching material; Brick patching material; brick replacement.

1.05 QUALITY ASSURANCE

- A. Comply with provisions of ACI 530/ASCE 5/TMS 402 and ACI 530.1/ASCE 6/TMS 602, except where exceeded by requirements of the contract documents.
- B. Restorer: Company specializing in masonry restoration with minimum 10 years of documented experience. Onsite personnel engaging in masonry work must have 5 years documented masonry restoration experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.

1.07 FIELD CONDITIONS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 60 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

1.08 PROJECT CONDITIONS

- A. Perform repointing before cleaning masonry surfaces.
- B. Do not allow cleaning runoff to drain into sanitary or storm sewers.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Paint Removal Materials:
 - 1. PROSOCO: www.prosoco.com.
- B. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 CLEANING MATERIALS

- A. Cleaning Agent: Detergent type.

2.03 PAINT REMOVAL MATERIALS

- A. Paint stripper: Prosoco Sure Klean 859 Stripper or Heavy Duty Paint Stripper as required to remove paint from masonry.

- B. Solution to remove chemical removal agent: Potable water.
- C. To test pH of surface stripped of paint: Phenolphthalien.
- D. Neutralizing agent: Clean, clear white vinegar or proprietary neutralizing agent
 - 1. Clean, clear white vinegar.
 - 2. Proprietary product: PROSOCO Sure Klean Restoration Cleaner.

2.04 MATERIALS

- A. New mortar shall duplicate the original in color, texture, and composition. Mortar shall be no harder than ASTM Type O which consists of 1 part Portland Cement, 2 part hydrated lime, and 9 parts sand.
- B. Stone patching: Jahn Restoration Mortar M70

2.05 MASONRY MATERIALS

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces to be cleaned are ready for work of this section.

3.02 PREPARATION

- A. Protect surrounding elements from damage due to restoration procedures.
- B. Carefully remove and store removable items located in areas to be restored, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.
- C. Separate areas to be protected from restoration areas using means adequate to prevent damage.
- D. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.
- E. When using cleaning methods that involve water or other liquids, install drainage devices to prevent runoff over adjacent surfaces unless those surfaces are impervious to damage from runoff.

3.03 REBUILDING - BRICK AND STONE REPLACEMENT UNITS

- A. Cut out damaged and deteriorated stone with care in a manner to prevent damage to any adjacent remaining materials.
- B. Support structure as necessary in advance of cutting out units.
- C. Cut away loose or unsound adjoining mortar and stone to provide firm and solid bearing for new work. Remove only whole brick units. Do not remove partial brick pieces.
- D. Mortar Mix: Colored and proportioned to match existing work.
- E. Ensure that anchors are correctly located and built in.
- F. Install built in stone work to match and align with existing, with joints and coursing true and level, faces plumb and in line. Build in all openings, accessories and fittings.

3.04 PAINT REMOVAL

- A. Examination and Preparation:
 - 1. Inspect, repair and replace as required flashing, gutters and downspouts.
 - 2. point any open mortar joints to prevent water and chemicals from entering the wall structure.
- B. Paint Removal:
 - 1. Manually scrape all loose paint and efflorescence using paint scrapers, putty knives or stiff bristle brushes. If mortar and bricks are quite crumbly, use a softer brush.
 - 2. Apply chemical paint remover with a brush, roller or appropriate spray equipment as directed by manufacturer. Pressure application of paint stripping materials shall not be done as it tends to drive the chemicals too far into the brick and mortar making it

impossible to remove all residue. Final dilution ratio to be determined by test patches done prior to removal process.

3. Allow the stripper to stay on the brick as directed by the manufacturer and as determined by test patches.
4. Rinse completely with clean, fresh water using pressure washing equipment to remove all paint and residue. Maintain water pressures as recommended by chemical manufacturer.
5. Apply a second coat of paint stripper if necessary to remove remaining paint, again following manufacturer's instructions.
6. Rinse completely again and apply afterwash as recommended by chemical manufacturer.
7. After paint has been removed, but before brick dries, apply neutralizer such as white vinegar, or a proprietary chemical neutralizer. A neutral Ph (7 pH) should be achieved be
8. Thoroughly rinse the surface with clean, clear water.
9. Test the pH with litmus paper or phenolphthalein:
 - a. Dissolve a 2" piece of phenolphthalein in denatured alcohol.
 - b. Brush the solution onto the surface. If it turns a shade from pink to magenta, there is still chemical residue.
 - c. Continue to neutralize the surface and test until there is no color change in the phenolphthalein solution or the litmus paper registers neutral.

3.05 CLEANING EXISTING MASONRY

- A. Cleaning Detergent: Brush clean masonry surfaces at all locations with cleaning agent in accordance with the manufacturer's instructions. Saturate masonry with clean water and flush loose mortar and dirt.

3.06 RESTORATION CLEANING

- A. Follow manufacturers instructions
- B. Clean surfaces and remove large particles with wood scrapers or non-ferrous wire brush.
- C. Provide a second application if required to match mock-up area.
- D. Allow sufficient time for water to remain on masonry and agitate with soft fiber brush or sponge.
- E. Rinse from the bottom up with potable water applied at 400 psi and at a rate of 4 gal/min.

3.07 FIELD QUALITY CONTROL

- A. Field Inspection: Architect/Engineer will perform inspections and prepare reports. Allow access to scaffolding and work areas, as needed to perform inspections.

3.08 CLEANING

- A. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.
- B. Remove excess mortar, smears, and droppings as work proceeds and upon completion.
- C. Clean surrounding surfaces.

END OF SECTION 04 0100

SECTION 04 2000
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete Block.
 - 1. Plain faced Concrete Block.
- B. Mortar and Grout.
- C. Reinforcement and Anchorage.
- D. Installation of loose steel lintels bearing on masonry.
- E. Installation of embedments and bearing plates in masonry.
- F. Accessories.
- G. Products Installed But Not Supplied Under This Section:
 - 1. Section 05 5000 - Metal Fabrications.

1.02 RELATED SECTIONS

- A. Section 01 4000 - Quality Requirements.
- B. Section 04 7200 - Cast Stone Masonry.
- C. Section 05 5000 - Metal Fabrications: Loose steel lintels and fabricated steel items.
- D. Section 05 5100 - Metal Stairs: Stair components anchored in unit masonry.
- E. Section 07 8400 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
- F. Section 07 9005 - Joint Sealers: Backing rod and sealant at control and expansion joints.
- G. Section 08 1113 - Hollow Metal Doors and Frames.

1.03 REFERENCE STANDARDS

- A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; 2011.
- B. ACI 530.1/ASCE 6/TMS 602 - Specification For Masonry Structures; American Concrete Institute International; 2008.
- C. ANSI/NBS A 74 (A41.2) "Building Code Requirements for Reinforced Masonry".
- D. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement; 2007.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- F. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
- G. ASTM C55 - Standard Specification for Concrete Building Brick; 2011.
- H. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2014.
- I. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2014.
- J. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.
- K. ASTM C150/C150M - Standard Specification for Portland Cement; 2015.
- L. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).
- M. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.
- N. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

- O. ASTM C476 - Standard Specification for Grout for Masonry; 2010.
- P. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2012.
- Q. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.
- R. IMIABC (CW) - Recommended Practices & Guide Specifications for Cold Weather Masonry Construction; International Masonry Industry All-Weather Council; 1993.
- S. IMIABC (HW) - Recommended Practices & Guide Specifications for Hot Weather Masonry Construction; International Masonry Industry All-Weather Council; current edition.
- T. UL (FRD) - Fire Resistance Directory; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting at least one week before starting work of this section; require attendance by all relevant installers, Construction Supervisor and other project participants. Meeting shall verify product requirements, substrate conditions, manufacturer's installation instructions, manufacturer's warranty requirements, and job-specific conditions as indicated in documents.
 - 1. Required attendees:
 - a. Architect.
 - b. Building Official (invited).
 - c. All relevant installers.
 - d. Other parties as necessary.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar.
- C. Shop Drawings: Submit shop drawings for fabrication, bending, and placement of reinforcement bars. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures." Show bar schedules, diagrams of bent bars, stirrup spacing, lateral ties and other arrangements and assemblies as required for fabrication and placement of reinforcement for unit masonry work.
- D. Submit brick and stone samples for selection by Owner.
- E. Manufacturer's Certificate: Submit certificates of compliance for masonry, mortar and grout materials.
- F. Test Reports: Submit results of pre-construction and construction testing.
- G. Construction Procedures: Submit proposed hot and/or cold weather construction procedures.
- H. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.06 QUALITY ASSURANCE

- A. See Section 01 4000 for testing and inspections requirements.
- B. An independent testing lab shall review manufacturer's test reports and certificates of compliance. Provide tests of mortar indicating compliance with listed standards.
- C. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.
- D. Fire Rated Assemblies: Conform to applicable code for design requirements for fire rated masonry construction indicated on drawings.
- E. Provide protection which will limit moisture absorption of concrete masonry units to the maximum percentage specified for the Type I units at a relative humidity which is normal for the project site.
- F. Source Control: Obtain each type of exposed masonry unit from a single manufacturer, with texture and color of each type uniform or of a uniform blend acceptable to Architect.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver masonry materials to project in undamaged condition. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes. Store cementitious materials off the ground, under cover and in dry location. Store aggregates where grading and other required characteristics can be maintained. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530.1/ASCE 6/TMS 602 or applicable building code, whichever is more stringent.

1.09 FIELD CONDITIONS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. General: Provide units of size, shape and number of vertical core spaces as necessary. If cores of units are not shown, use units which provide minimum clearances and grout coverage for number and size of vertical reinforcement bars shown. Where horizontal reinforced beams (bond beams) are shown, use units with closed bottoms and open ends. Provide uncured or unfrogged units with all exposed surfaces finished for sills, caps and similar applications exposing surfaces otherwise concealed from view.
- B. Concrete Block: Comply with referenced standards and as follows:
 - 1. Manufacturers:
 - a. Amcon Block and Precast, Inc. manufactured with "Sustainable Solutions Mix Design".
 - b. Anchor Block Company.
 - c. County Concrete Corporation.
 - d. Shieley Masonry Products.
 - 2. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
 - 3. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, control joint edges, pilasters, and other detailed conditions.
 - 4. Load-Bearing Units: Grade N, Type 1 complying with ASTM C 90, normal weight.
 - a. Hollow block, as indicated.
 - b. Exposed Faces: Special color where indicated on drawings.
 - 5. Non-Loadbearing Units: ASTM C 129, Type 1.
 - a. Hollow block.
 - b. Exposed Faces: Special color where indicated on drawings.

2.02 REINFORCEMENT AND ANCHORAGE

- A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420) deformed billet bars; longitudinal bars are to be uncoated, cross bars are to be galvanized.
- B. Single Wythe Joint Reinforcement: Truss type; ASTM A82/A82M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B; 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not more than 1 inch and not less than 1/2 inch of mortar coverage on each exposure.
 - 1. Manufacturers:
 - a. Dur-O-Wall: www.dur-o-wal.com.
 - b. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

- C. Sill Plate Anchor Bolts: As detailed or noted on the structural drawings.
- D. Bolts for Tie-Downs: At locations, and as detailed or noted on structural drawing sheets (may require up to 21" embedment).

2.03 ACCESSORIES

- A. Preformed Control Joints: Neoprene material. Provide with corner and tee accessories, fused joints.
 - 1. Manufacturers:
 - a. Dur-O-Wal; Product RE41: www.dur-o-wal.com.
 - b. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- B. Bond-Breaker (Building Paper): ASTM D 226, Type I ("No.15") asphalt felt.
- C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.04 LINTELS

- A. Steel Lintels: See Section 05 5000 - Metal Fabrications.

2.05 MORTAR AND GROUT MIXES

- A. Mortar for Non-Reinforced Unit Masonry: ASTM C 270, using the Proportion Specification.
 - 1. Interior, loadbearing masonry: Type N.
 - 2. Interior, non-loadbearing masonry: Type O.
 - 3. Limit cementitious materials in mortar to Portland cement-lime.
 - 4. Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise approved.
- B. Mortar Mixing.
 - 1. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
 - 2. Maintain sand uniformly damp immediately before the mixing process.
 - 3. Add mortar color in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
 - 4. Do not use anti-freeze compounds to lower the freezing point of mortar.
 - 5. If water is lost by evaporation, re-temper only within two hours of mixing.
 - 6. Use mortar within two hours after mixing at temperatures of 90 degrees F, or two-and-one-half hours at temperatures under 40 degrees F.
- C. Grout: ASTM C 476. Consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of four inches or less; coarse grout for spaces with smallest horizontal dimension greater than four inches.
- D. Engineered Masonry: 3,000 psi strength at 28 days; 8-10 inches slump; mix in accordance with ASTM C 476.
 - 1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
 - 2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
- E. Grout Mixing.
 - 1. Mix grout in accordance with ASTM C94/C94M.
 - 2. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.
 - 3. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary formwork and bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and all other reasonable temporary loads that may be placed on them during construction.
- C. Verify that weather resistive barrier is installed on face of sheathing correctly, per Section 07 26 10 Weather Resistive Barriers, and approved by the manufacturer's representative. Barrier to be fully shingle-lapped and lapped over all flashing. Install, reinstall, or repair where barrier is missed or damaged.

3.03 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Maintain vertical continuity of core or cell cavities, which are to be reinforced and grouted, to provide minimum clear dimension indicated and to provide minimum clearance and grout coverage for vertical reinforcement bars.
- D. Concrete Masonry Units:
 - 1. Bond: Running unless indicated otherwise.
 - 2. Coursing: One unit and one mortar joint to equal 12 inches.
 - 3. Mortar Joints: Concave, except at walls to receive waterproofing are to be flush.

3.04 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay hollow masonry units with face shell bedding on head and bed joints.
- C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- D. Remove excess mortar and mortar smears as work progresses.
- E. Interlock intersections and external corners.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Interior mortar joints are to be tooled after the mortar has become thumbprint-hard.

3.05 POINTING

- A. During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point up all joints including corners, openings and adjacent work to produce a neat uniform appearance. Tool joints to a smooth, concave surface. All exterior below grade joints to be flush.

3.06 REINFORCEMENT AND ANCHORAGE - GENERAL

- A. Before placing, clean reinforcement of loose rust, mill scale or other materials which will reduce bond to mortar or grout. Do not use bars with kinks or bends not shown on drawings or final shop drawings, or bars with reduced cross section due to excessive rusting or other causes.
- B. Unless otherwise indicated on drawings or specified under specific wall type, install continuous horizontal joint reinforcement 16 inches on center, and immediately above and below openings, for a distance of 2' beyond jambs of openings.
- C. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

- D. Place continuous joint reinforcement in first and second joint below top of walls.
- E. Lap joint reinforcement ends minimum 6 inches.

3.07 REINFORCEMENT AND ANCHORAGE - SINGLE WYTHE MASONRY

- A. Install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.

3.08 REINFORCEMENT BAR INSTALLATION

- A. Position reinforcement accurately at the spacing indicated. Coordinate grouted cores and vertical rod locations with anchor bolt and tie-down locations.
- B. Place vertical reinforcement before grouting.
- C. Support and secure vertical bars against displacement but not less than intervals not exceeding 192 bar diameters nor 10' on center.
- D. Tie vertical reinforcement to dowels where shown and thread units over or around reinforcement. Where vertical members are shown in close proximity, provide a clear distance between bars of not less than the nominal bar diameter or 1" (whichever is greater).
- E. Provide lapped splices, unless otherwise indicated. Splice reinforcement bars where shown; do no splice at other points unless acceptable to the Architect. In splicing vertical bars or attaching to dowels, lap ends, place in contact and wire tie. Provide not less than minimum lap indicated, or if not indicated, as required by governing code. If welded splices are indicated, comply with the requirements of AWS D1.4 for welding materials and procedures.

3.09 COLUMNS, PIERS AND PILASTERS

- A. Use units of the size, shape and number of vertical core spaces shown. If not shown, use units which provide minimum clearances and grout coverage for number and size of vertical reinforcement bars shown. Provide pattern bond shown, or if not shown, alternate head joints in vertical alignment. Where bonded pilaster construction is shown, lay wall and pilaster units together to maximum pour height specified.
- B. Provide a clear distance between vertical bars as indicated, but not less than 1-1/2 times the nominal bar diameter or 1-1/2", whichever is greater. Provide lateral ties as indicated.

3.10 LINTELS

- A. Install loose steel lintels over openings where steel lintels are indicated or scheduled.
- B. Maintain minimum 4 inch bearing on each side of opening for steel lintels with a span of 6 feet or less. Maintain minimum 8 inch bearing on each side of opening for steel lintels over 6 feet and masonry lintels, unless noted otherwise. Lintels and beams spanning over three feet shall bear on solid masonry at least 8" thick vertically. Fill cores in hollow concrete masonry units with grout 3 courses (24") under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated. Fill joints with mortar.

3.11 GROUTED COMPONENTS

- A. Reinforce bond beams with 2, No. 5 bars, continuous/lapped 48 bar diameters or as indicated, with minimum 2" of cover.
- B. Grout all bearing locations and all cores below slab elevations.
- C. Grout all top course cores at all walls where sill plate will rest on masonry.
- D. Lap splices minimum 48 bar diameters.
- E. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- F. Place and consolidate grout fill without displacing reinforcing.

- G. Preparation for Grouting: Prior to grouting, inspect and clean grout spaces. Remove dust, dirt, mortar droppings, loose pieces of masonry and other foreign materials from grout spaces. Clean reinforcement and adjust to proper position. Clean top surface of structural members supporting masonry to ensure bond.
- H. Grouting: Provide minimum clear dimension of 2" and clear area of 8 square inches in vertical cores to be grouted. Place vertical reinforcement prior to laying of units. Extend above elevation of maximum pour height as required for splicing. Support in position at vertical intervals not exceeding 192 bar diameters nor 10 feet. Pour grout using chute or container with spout.
- I. Limits of Grout Pours: Limit group pours to sections which can be completed in one working day with not more than one hour interruption of pouring operation. Place grout in lifts which do not exceed 4' unless reviewed for compliance with high-lift procedures outlined in ACI530, latest adoption. Allow not less than 30 minutes, nor more than one hour between lifts of a given pour. Rod or vibrate each grout lift during pouring operation. Place grout in lintels or beams over openings in one continuous pour.

3.12 CONTROL JOINTS

- A. Do not continue horizontal joint reinforcement through control joints.
- B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill and keep joint clean of mortar droppings. Rake joint at exposed unit faces for placement of backer rod and sealant.
- C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- D. Size control joint in accordance with Section 07 90 05 - Joint Sealers for sealant performance.
- E. Provide control and expansion joints and build other work into the masonry work as shown, fitting masonry units around other work, and grouting for secure anchorage. Control and Expansion Joints are to be as follows:
 - 1. Provide soft joint below ledges, floor slabs or shelf angles.
 - 2. Provide vertical expansion joints at intersecting walls, openings, and at intersections with dissimilar materials. Joints shall extend through parapets.
 - 3. Fill joint with backer rod and seal with polyurethane or low-modulus silicone sealant.
 - 4. Joints at other openings including door, window and louver frames shall be filled. Joints to be 1/4-3/8" wide and cleaned 3/4" deep.
 - 5. For all joints use proper primer prior to sealing joint.
 - 6. If a window joint occurs immediately below a steel shelf, provide a sealant joint.
 - 7. Typical vertical joint locations shall be as indicated on building elevations and at a minimum shall include:
 - a. All inside corners.
 - b. 1' on 1 side of all outside corners.
 - c. Maximum 30' o.c.

3.13 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
 - 1. Fill completely all adjacent masonry cores with grout minimum 8 inches from framed openings.
- D. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
- E. Do not build into masonry construction organic materials that are subject to deterioration.

- F. Set anchor bolts for sill plates, as shown on structural drawing sheets, maximum of 72" on center and embedded at least 7" into minimum 6" block course.
- G. Set bolts for tie-down as shown in structural drawing sheets. Provide embedment as noted. Coordinate location with tie-down locations.

3.14 TOLERANCES

- A. Maximum Variation from Alignment of Columns: 1/4 inch.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.15 CUTTING AND FITTING

- A. Cut and fit for chases, pipes, conduit, sleeves, grounds, and sills. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.16 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. The Contractor shall pay for all inspections and tests needed to document submittals, certify product compliance, and establish mix designs.
- C. Masonry units, reinforcement, cement, lime, aggregate, and all other materials shall meet the requirements of the applicable standards of quality and shall be properly stored and prepared for use.
- D. Mortar and grout shall be properly mixed using specified proportions. The method of measuring materials shall properly control the properties of materials.
- E. Placement, splicing and reinforcing dimension shall be in accordance with the plans and specifications.
- F. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140 for conformance to requirements of this specification.
- G. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.17 REPAIR

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

3.18 CLEANING

- A. General: Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable standards. Use dilution ratio to produce weakest solution recommended by masonry cleaner manufacturer. Do not use acid solution. Verify with masonry cleaner manufacturer the effect of temperature on the strength of the solution.
- B. Test Cleaning Methods: Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry. Verify cleaning material and procedure compatibility with manufacturer.

- C. Procedure: After mortar is thoroughly set and cured, clean masonry as follows: For concrete masonry, let mortar harden slightly and remove droppings with trowel. Rub block with stiff fiber bristle or stainless steel brush. For clay brick: use wooden paddle or non-metallic scraper to remove large particles of fresh mortar. For smaller areas, use a medium-soft fiber bristle brush, wash mud/dirt with a detergent solution. Protect adjacent non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape. Clean small sections at a time. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.

3.19 PROTECTION

- A. During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- B. Protect newly laid masonry from exposure to precipitation, excessive drying, freezing, soiling, backfill and other harmful elements.
- C. Keep air cavity spaces clear of mortar.
- D. Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately grout or mortar in contact with such masonry.
- E. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
- F. Protect sills, ledges and projections from droppings of mortar.
- G. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns. Do not apply concentrated loads for at least three days after building masonry walls or columns. Brace walls as necessary.
- H. Dry-brush masonry work at end of each day's work.
- I. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION 04 2000

SECTION 04 4200
EXTERIOR STONE CLADDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cut granite veneer at exterior walls.
- B. Metal anchors and supports.
- C. Sealing exterior joints.
- D. Pointing interior joints.

1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications: Metal fabricated items for building into cut stone.
- B. Section 07 6200 - Sheet Metal Flashing and Trim: Flashings at copings, lintels, and sills.
- C. Section 07 9005 - Joint Sealers: Sealing perimeter and expansion joints in interior stone work.

1.03 REFERENCE STANDARDS

- A. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2015b.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- C. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- E. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2008 (Reapproved 2012).
- F. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2002 (Reapproved 2013).
- G. ILI (HB) - Indiana Limestone Handbook; 2007.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples, for submittal procedures.
- B. Product Data: Provide data on stone, mortar products, and sealant products.
- C. Shop Drawings: Indicate layout, pertinent dimensions, profiles, anchorages, head, jamb, and sill opening details, and jointing methods.
- D. Samples: Submit two stone samples 12 x 12 inch in size, illustrating color range and texture, markings, surface finish.
- E. Samples: Submit mortar color samples.
- F. Installation Instructions: Submit stone fabricator's installation instructions and field erection or setting drawings; indicate panel identifying marks and locations on setting drawings.

1.06 QUALITY ASSURANCE

- A. Design anchors and supports under direct supervision of a Professional Structural Engineer, registered in the State in which the Project is located.
 - 1. Design anchors to resist positive and negative wind pressures and other loads as required by applicable code.
 - 2. Design anchor attachment to stone with a factor of safety of 5:1.
 - 3. Design each individual anchor with a factor of safety in the vertical dead-load-bearing direction of 4:1 and in the horizontal lateral-load-bearing direction of 2:1.
- B. Perform work in accordance with ILI Indiana Limestone Handbook.

- C. Stone Fabricator: Company specializing in fabricating cut stone with minimum ten years of documented experience.
- D. Installer Qualifications: Company specializing in performing the work of this section with minimum ten years of experience.

1.07 FIELD CONDITIONS

- A. During temporary storage on site, at the end of working day, and during rainy weather, cover stone work exposed to weather with non-staining waterproof coverings, securely anchored.

PART 2 PRODUCTS

2.01 STONE

- A. Salvage stone from parts of existing historic building that are to be demolished.
 - 1. Cut, shape, coursing style, and texture surface of stone to match adjacent stone where each stone is to be installed.

2.02 MORTAR

- A. Mortar: ASTM C270, Type N, Proportion specification, using Portland cement of white color.

2.03 ANCHORS AND ACCESSORIES

- A. Anchors and Other Components in Contact with Stone: Stainless steel, ASTM A666, Type 304.
 - 1. Sizes and configurations: As required for vertical and horizontal support of stone and applicable loads.
 - 2. Wire ties are not permitted.
- B. Support Components not in Contact with Stone: Stainless steel, ASTM A240/A240M, Type 304.
- C. Setting Buttons and Shims: Lead type.
- D. Flashings: Through wall flashing with exposed stainless steel drip..
- E. Bond Breaker: 10 mil (0.25 mm) thick plastic sheet.
- F. Joint Sealant: ASTM C920 silicone sealant with movement capability of at least plus/minus 25 percent and non-staining to stone when tested in accordance with ASTM C1248.
- G. Joint Backer Rod: ASTM C1330 open cell polyurethane of size 40 to 50 percent larger in diameter than joint width.

2.04 STONE FABRICATION

- A. Panel Size: As indicated on drawings and/or determined at job site.
- B. Where corner detail is not indicated, form external corners to quirk joint profile.
- C. Slope exposed top surfaces of stone and horizontal sill surfaces for natural wash.
- D. Cut drip slot in bottom surface of work projecting more than 1/2 inch over wall openings. Size slot not less than 3/8 inch wide and 1/4 inch deep; full width of projection.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that support work and site conditions are ready to receive work of this section.
- B. Verify that items built-in under other sections are properly located and sized.

3.02 PREPARATION

- A. Clean stone prior to erection. Do not use wire brushes or implements that will mark or damage exposed surfaces.

3.03 INSTALLATION

- A. Install flashings of longest practical length and seal watertight to back-up. Lap end joint minimum 6 inches and seal watertight.
- B. Erect stone in accordance with stone supplier's instructions and erection drawings.
- C. Set stone with a consistent joint width of 3/8 inch.

- D. Install anchors and place setting buttons to support stone and to establish joint dimensions.
- E. Install weep/cavity vents in vertical stone joints at _____ inches on center horizontally, immediately above horizontal flashings, above shelf angles and supports, at bottom of walls, and at top of each cavity space; do not permit mortar accumulation in cavity space.
- F. Joints in Exterior Work: Seal joints with joint sealant over backer rod, following sealant manufacturer's instructions; tool sealant surface to concave profile.
- G. Joints in Interior Work: Leave perimeter joints and expansion joints open for sealant; fill other joints with pointing mortar; pack and work into voids; tool surface to concave joint.

3.04 TOLERANCES

- A. Positioning of Elements: Maximum 1/4 inch from true position.
- B. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet; 1/2 inch in 50 feet.
- C. Maximum Variation Between Face Plane of Adjacent Panels: 1/16 inch.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in any two stories.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 feet; 1/4 inch in 10 feet; 1/2 inch maximum.
- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

3.05 CUTTING AND FITTING

- A. Obtain approval prior to cutting or fitting any item not so indicated on Drawings.
- B. Do not impair appearance or strength of stone work by cutting.

3.06 CLEANING

- A. Remove excess joint material upon completion of work.
- B. Clean soiled surfaces with cleaning solution.
- C. Use non-metallic tools in cleaning operations.

END OF SECTION 04 4200

SECTION 05 1200
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural steel framing members.
- B. Structural steel support members and struts.
- C. Base plates, shear stud connectors and expansion joint plates.
- D. Grouting under base plates.

1.02 RELATED REQUIREMENTS

- A. Section 05 1213 - Architecturally-Exposed Structural Steel Framing: Additional requirements for structural steel members designated as architecturally-exposed structural steel (AESS).
- B. Section 05 3100 - Steel Decking: Support framing for small openings in deck.
- C. Section 05 5000 - Metal Fabrications: Steel fabrications affecting structural steel work.
- D. Section 07 8100 - Applied Fireproofing: Fireproof protection to framing and metal deck systems.

1.03 REFERENCE STANDARDS

- A. AISC (MAN) - Steel Construction Manual; 2011.
- B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; 2010.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- D. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2013.
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- F. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- G. ASTM A242/A242M - Standard Specification for High-Strength Low-Alloy Structural Steel; 2004 (Reapproved 2009).
- H. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.
- I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- K. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality; 2014.
- L. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2015.
- M. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts [Metric]; 2007.
- N. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel; 2015.
- O. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011 (Reapproved 2015).
- P. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2013.
- Q. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
- R. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2016.

- S. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- T. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- U. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
- V. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2009.
- W. SSPC-SP 3 - Power Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 - 2. Connections not detailed.
 - 3. Indicate cambers and loads.
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
- D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."
- B. Fabricator: Company specializing in performing the work of this section with minimum five years of documented experience.
- C. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
- D. Erector: Company specializing in performing the work of this section with minimum _____ years of documented experience.
- E. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Angles and Plates: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Rolled Steel Structural Shapes: ASTM A992/A992M.
- D. Steel Shapes, Plates, and Bars: ASTM A242/A242M high-strength, corrosion-resistant structural steel.
- E. Steel Shapes, Plates, and Bars: ASTM A529/A529M high-strength, carbon-manganese structural steel, Grade 50.
- F. Steel Plates and Bars: ASTM A572/A572M, Grade 50 (345) high-strength, columbium-vanadium steel.
- G. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.
- H. Hot-Formed Structural Tubing: ASTM A501/A501M, seamless or welded.

- I. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.
- J. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A and galvanized in compliance with ASTM A153/A153M, Class C.
- K. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436/F436M washers.
- L. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- M. Sliding Bearing Plates: Teflon coated.
- N. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
 - 2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.
- O. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.
- P. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.
- Q. Bar Grating: Galvanized at exterior locations.

2.02 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.
- D. Develop required camber for members.

2.03 FINISH

- A. Prepare structural component surfaces in accordance with SSPC-SP 3.
- B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.
- C. Galvanize structural steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.

2.04 SOURCE QUALITY CONTROL

- A. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".
- B. Welded Connections: Visually inspect all shop-welded connections per AWS D1.1. All full welds shall be tested by Ultrasonic Inspection per ASTM E164.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

- A. Erect structural steel in compliance with AISC S303 "Code of Standard Practice for Steel Buildings and Bridges" and latest AISC 360, latest adoption.
- B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".

- E. Do not field cut or alter structural members without approval of Architect.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
- B. Special Structural Testing and Inspection Services: Structural Testing and Inspection shall be performed by qualified parties as specified herein. Include items required by the 2012 IBC, as adopted by the current Minnesota State Building Code and other items which in the professional judgment of the Structural Engineer of Record, are critical to the integrity of the building structure.
- C. Personnel Qualifications:
 - 1. Special Inspector – Technical: Shall be employed by a testing agency and shall be supervised by an A.W.S./C.W.I. with a minimum of 10 years experience or an A.S.N.T. Level III with a minimum of 10 years experience. Individuals shall satisfy the following requirements:
 - a. Technical I: Non-destructive Testing Technician A.S.N.T.-TC-1A Level I, and/or A.W.S./C.A.W.I.
 - b. Technical II: Non-destructive Testing Technician A.S.N.T. TC-1A Level II, (NDE Technician II), A.W.S./C.A.W.I., with minimum 3 years experience, or an A.W.S./C.W.I.
 - c. Technical III: A.S.N.T. Level III with a minimum of 10 years experience or an A.W.S./C.W.I. with a minimum of 10 years experience.
 - 2. Special Inspector – Structural.
 - a. Structural I: Graduate civil/structural engineer, or other personnel acceptable to the SER, with experience in design of structural systems of the project type. Inspections shall be performed under the direct supervision of a registered civil/structural engineer.
 - b. Structural II: Civil/structural engineer regularly engaged in the design of structural systems of the project type, registered in the state in which the project is located. The registered engineer shall review and approve all inspection reports.
 - c. Special Inspectors - Structural, may be an employee of the SER.
- D. The Owner will provide the following tests and inspections:
 - 1. Test high strength bolted connections according to the requirements of R.C.S.C. "Specification for Structural Joints Using ASTM A325 or ASTM A490 Bolts", UBC Standard 27-7 and as follows:
 - a. Preparation: Visually inspect mating surfaces and bolt type for all bolted connections for general conformance with the contract documents prior to bolting. Qualifications: Technical II.
 - b. Slip Critical Bolts and Tension Bolts: Test bolt tightening in 10% of all bolts. Test a minimum of two bolts in each connection. Verify that all plies of connected elements have been brought into contact at 100% of connections. Verify all tips are removed from "twist-off" bolts. Qualifications: Technical II.
 - c. Bearing Bolts: Visually inspect to confirm all plies of connected elements have been brought into contact at 100% of connections. (Applies only to bolts designed with

- threads included in failure plane; all other bolts require testing as for tension bolts.)
Qualifications: Technical II.
- d. Shop Fabricated Work: Perform tests required above, except bolt testing may be reduced or deleted, if fabrication shop satisfies AISC Quality Certification Program - Category I, or more stringent criteria, or is approved by Building Official and SER.
2. Test welding as follows:
- a. Fillet Welds: Visually inspect 100% of all fillet welds, for size, length, and quality, per AWS D1.1. Qualifications: Technical II.
 - b. Partial Penetration Welds: Test 100% of all partial penetration welds exceeding 5/16 inch, using Ultrasonic Testing per AWS D1.1, Section 6. Test 25% of all penetration welds less than 5/16 inch, using Magnetic Particle Testing per ASTM E-109 performed on root pass and on finished weld. Qualifications: Technical II.
 - c. Full Penetration Welds: Test 100% of all full penetration welds exceeding 5/16 inch, using Ultrasonic Testing per AWS D1.1 Section 6. Test 25% of all full penetration welds less than 5/16 inch, using Magnetic Particle Testing per ASTM E-109 performed on root pass and on finished weld. Qualifications: Technical II.
 - d. Procedures and Preparation: Qualifications: Technical II. Verify the following:
 - 1) Qualifications of all welders as AWS certified.
 - 2) Proposed welding procedures and materials.
 - 3) Adequate preparation of faying surfaces.
 - 4) Preheat and interpass temperatures of steel, proper technique and sequence of welding, and cleaning and number of passes.
 - e. Shop Fabricated Work: Perform tests as noted above for shop fabricated work, except fillet weld and partial penetration weld testing may be reduced or deleted, if fabrication shop satisfies AISC Quality Certification Program - Category I, or more stringent criteria, or is approved by Building Official and SER.
3. Expansion Bolting and Adhesive Anchoring: Be present on the job site continuously during installation to verify bolt type and dimensions, concrete type and compressive strength, pre-drilled hole dimensions, embedment, spacing, edge distances, slab thickness, and tightening torque. Qualifications: Technical II.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- F. In addition to visual inspection, test and inspect shear connectors according to requirements in AWS D1. 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.

END OF SECTION 05 1200

SECTION 05 3100
STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Roof deck.
- B. Composite floor deck.
- C. Bearing plates and angles.
- D. Stud shear connectors.

1.02 RELATED SECTIONS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete topping over metal deck.
- B. Section 03 3000 - Cast-In-Place Concrete: Placement of anchors for bearing plates cast in concrete.
- C. Section 04 2000 - Unit Masonry: Placement of anchors for bearing plates embedded in unit masonry assemblies.
- D. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 18 inches .
- E. Section 05 5000 - Metal Fabrications: Steel angle concrete stops at deck edges.
- F. Section 07 8100 - Applied Fireproofing: Spray applied fireproofing.

1.03 REFERENCE STANDARDS

- A. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2007.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2008.
- D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2008a.
- E. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- F. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2008.
- G. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
- H. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.
- I. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- J. UL (FRD) - Fire Resistance Directory; current edition.

1.04 PERFORMANCE REQUIREMENTS

- A. Select and design metal deck in accordance with SDI Design Manual.
- B. Calculate to structural working stress design and structural properties specified.
- C. Maximum Vertical Deflection of Floor Deck: 1/360.
- D. Maximum Vertical Deflection of Roof Deck: 1/240.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.

- B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
- C. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
- D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
- E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.06 QUALITY ASSURANCE

- A. The fabricator and erector shall each have a minimum of 5 years experience in performing the Work of this Section. The fabricator and erector shall submit resumes showing compliance with the Work experience requirement to the A/E for written approval prior to starting the Work.
- B. The Contractor shall provide certification that welders to be employed in this Work have satisfactorily passed AWS qualification tests. Fabricator(s) and erector(s) shall submit current welding certifications, for fabrication plant and field welding, to the A/E for written approval prior to the start of welding. If re-certification of welders is required, re-testing shall be the Contractor's responsibility.
- C. The fabrication plant shall comply with the Quality Control provisions as established by the Steel Deck Institute. Submit documentation that verifies compliance to the A/E for their written approval prior to start of deck work. Fabrication shall also be approved by the building official and the A/E's structural engineer in writing prior to start of deck work.
- D. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
- E. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Cut plastic wrap to encourage ventilation.
- B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steel Deck:
 1. Nucor-Vulcraft Group: www.vulcraft.com.
 2. **MMY - OTHERS - NONE?**

2.02 STEEL DECK

- A. Roof Deck: Non-composite type, fluted steel sheet:
 1. Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS, Grade 33, Type 1.
 2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
 3. Structural Properties:
 - a. Section Modulus: _____.
 - b. Span Design: Double.
 4. Minimum Base Metal Thickness: 22 gage, 0.0299 inch.
 5. Minimum Base Metal Thickness: as indicated on drawings.
 6. Nominal Height: 1.5 inch.
 7. Profile: Fluted; as indicated on drawings..
 8. Formed Sheet Width: 24 inch.
 9. Side Joints: Lock seam.

10. End Joints: Lapped, welded.
- B. Composite Deck:
 1. Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, Structural Steel (SS), Grade 40 minimum, with top surface phosphatized and unpainted and underside surface shop primed with manufacturers' standard baked-on, rust-inhibitive primer.
 2. Profile Depth: As indicated.
 3. Design Uncoated-Steel Thickness: As indicated.
 4. Span Design: Double.
 5. Formed Sheet Width: 30 inch.
 6. Side Joints: Lock seam.
 7. End Joints: Lapped, welded.
 8. Fire Resistance Classification: Comply with UL (FRD) Assembly Number ____.

2.03 ACCESSORY MATERIALS

- A. Bearing Plates and Angles: ASTM A36/A36M steel, unfinished.
- B. Stud Shear Connectors: Made from ASTM A 108 Grade 1015 bars.
- C. Welding Materials: AWS D1.1/D1.1M.
- D. Fasteners: Galvanized hardened steel, self tapping.
- E. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- F. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.

2.04 FABRICATED DECK ACCESSORIES

- A. Sheet Metal Deck Accessories: Metal closure strips and cover plates, 22 gage, 0.0299 inch thick sheet steel; of profile and size as indicated; finished same as deck.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. On steel supports provide minimum 1-1/2 inch bearing.
- C. Fasten deck to steel support members at ends and intermediate supports at 12 inches on center maximum, parallel with the deck flute and at each transverse flute using methods specified.
 1. Welding: Use fusion welds through weld washers.
- D. Clinch lock seam side laps.
- E. Weld deck in accordance with AWS D1.3.
- F. At deck openings from 6 inches to 18 inches in size, provide 2 x 2 x 1/4 inch steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.
- G. At deck openings greater than 18 inches in size, provide steel angle reinforcement. as specified in Section 05 1200.
- H. Where deck (other than cellular deck electrical raceway) changes direction, install 6 inch minimum wide sheet steel cover plates, of same thickness as deck. Fusion weld 12 inches on center maximum.
- I. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.
- J. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
- K. Weld stud shear connectors through steel deck to structural members below.

- L. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer or spray-on galvanizer.

END OF SECTION 05 3100

SECTION 05 4000
COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Formed steel stud exterior wall and interior wall framing.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood blocking and miscellaneous framing.
- B. Section 06 1000 - Rough Carpentry: Roof and wall sheathing.
- C. Section 07 2100 - Thermal Insulation: Insulation within framing members.
- D. Section 07 2500 - Vapor Retarders: Vapor barrier over sheathing.
- E. Section 07 2610 - Weather Resistive Membranes: Weather barrier over sheathing.
- F. Section 09 2116 - Gypsum Board Assemblies: Lightweight, non-load bearing metal stud framing.
- G. Section 09 2116 - Gypsum Board Assemblies: Gypsum wall and ceiling board.

1.03 REFERENCE STANDARDS

- A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- D. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2011c.
- E. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2011a.

1.04 ADMINISTRATIVE REQUIREMENTS

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings Product Data and Samples for submittal procedures.
- B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations.
- C. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
 - 1. Indicate locations of cold formed framing assemblies.
 - 2. Indicate sizes and spacing of framing components.
 - 3. Indicate fastening methods between framing members and to adjacent products/materials.
 - 4. Indicate bearings, anchors, and other products required for construction activities of this section; indicate products not supplied by manufacturer of products of this section.
- D. Manufacturer's Instructions: Printed installation instructions for products specified in this section.
- E. Design Data: Calculations for loading and stresses, bearing seal and signature of Professional Engineer registered in the State of Minnesota.
- F. Mill Certificates for each type of structural framing member, indicating the following information:
 - 1. Bare metal thickness of steel, measured to 1/1000 inch (0.025 mm).
 - 2. Yield strength of steel.
 - 3. Tensile strength of steel.
 - 4. Total elongation of steel in two (2) inch (50 mm) gauge length.
 - 5. Chemical analysis of steel.

6. Thickness of galvanized coating, measured to 1/1000 (0.025 mm).

1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum five (5) years of documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum five (5) years documented experience.

1.07 FIELD MEASUREMENTS

- A. Verify actual locations of cold-formed metal framing and other construction to which the framing must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of Work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Framing:
 1. ClarkDietrich Building Systems: www.clarkdietrich.com.
 2. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
 3. Substitutions: See Section 01 6000 - Material and Equipment.
- B. Framing Connectors and Accessories:
 1. Same manufacturer as metal framing.

2.02 FRAMING SYSTEM

- A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
- B. Design Criteria: Provide completed framing system having the following characteristics:
 1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S100-12.
 2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
 3. Design Loads: In accordance with applicable codes.
 4. Live load deflection meeting the following, unless otherwise indicated:
 - a. Exterior Walls: Maximum horizontal deflection under wind load of 1/180 of span.
 5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
 6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

2.03 FRAMING MATERIALS

- A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
 1. Gage and Depth: As required to meet specified performance levels.
 2. Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating.
- B. Framing Connectors: Factory-made, formed steel sheet.
 1. Material: ASTM A653/A653M SS Grade 33 and 40 (minimum), with G90/Z275 hot dipped galvanized coating for base metal thickness less than 10 gage, 0.1345 inch, and factory punched holes and slots.
 2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.

3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
 - a. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
4. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.
5. Wall Stud Bridging Connections: Provide mechanical load-transferring devices that accommodate wind load torsion and weak axis buckling induced by axial compression loads. Provide bridging connections where indicated on the drawings.

2.04 FASTENERS

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
- B. Anchorage Devices: Powder actuated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify field measurements and adjust installation as required.

3.02 INSTALLATION OF STUDS

- A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.
- B. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using clip and tie method.
- C. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
- D. Install intermediate studs above and below openings to align with wall stud spacing.
- E. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
- F. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- G. Touch-up field welds and damaged galvanized surfaces with primer.

END OF SECTION 05 4000

SECTION 05 5000
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel and aluminum items.
 - 1. Lintels, plates, and miscellaneous supports.
 - 2. Stair overrun gates.
 - 3. Welded wire mesh panels.
 - 4. Pipe bollards.
 - 5. Area well grates.
 - 6. Perforated metal screening.
 - 7. Chainlink Fencing for Tenant Storage Area
- B. Cast iron fabrications:
 - 1. Cast iron detectable warning plates.
 - 2. Cast iron tree gates.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 04 4200 - Exterior Stone Cladding.
- D. Section 05 5100 - Metal Stairs.
- E. Section 09 9000 - Painting and Coating: Paint finish.

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
- B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- D. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2003 (Reapproved 2016).
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- G. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.
- H. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.
- I. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- J. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- K. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- L. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- M. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- N. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2012.

- O. ASTM B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes (Metric); 2012.
- P. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2012.
- Q. ASTM B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire (Metric); 2012.
- R. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- S. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- T. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
- U. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- V. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- W. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata.
- X. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
- Y. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).
- Z. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- AA. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide manufacturer's data sheets on each ladder safety system product to be used, including installation instructions.
- C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.
 - a. Include the following, as applicable:
 - 1) Design criteria.
 - 2) Details of connections.
 - 3) Support reactions.
 - 4) Bracing requirements.
- D. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.
- E. Designer's Qualification Statement.
- F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Slotted Channel Framing: ASTM A653/A653M, Grade 33.
- F. Slotted Channel Fittings: ASTM A1011/A1011M.
- G. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
- H. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- I. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- J. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- K. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- B. Sheet Aluminum: ASTM B209 (ASTM B209M), 5052 alloy, H32 or H22 temper.
- C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210 (ASTM B210M), 6063 alloy, T6 temper.
- D. Aluminum-Alloy Bars: ASTM B211 (ASTM B211M), 6061 alloy, T6 temper.
- E. Bolts, Nuts, and Washers: Stainless steel.
- F. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.03 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED ITEMS

- A. Welded Wire Mesh Panels:
 - 1. Panel fabric: 8 gauge welded wire mesh with wires at 4 inches on center each way. Wire shall be welded and hot-dipped galvanized after welding process.
 - 2. Panel frame: 3/4 by 1 1/2 by 1/8 inch hot-dipped galvanized steel angles.
- B. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
- C. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
- D. Lintels: As detailed; galvanized finish.
- E. Steel Railings, Guardrails and Supports:

1. ASTM A53, type and grade as required for design loading (if applicable), black finish; standard weight (Schedule 40) unless otherwise indicated. Provide steel pipe, railings, channels, bar stock, stops, wire mesh, plate trim and mounting accessories as necessary. Weld all joints and connections and grind smooth. Provide all necessary fastenings. Provide sleeves for setting pipe rails. Provide standard cast (Blum #386) wall mounting brackets as necessary. Hand rails shall be nominal 1-1/4" pipe unless otherwise indicated on the drawings. Return handrails to walls. Provide posts where indicated but not over 8" on center.
- F. Railings and Miscellaneous Steel Trim:
1. Fabricate to shapes and sizes as required for profiles shown; continuous welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages; coordinate assembly and installation with other work.
- G. Perforated Metal Screening:
1. 16 gauge factory finished steel sheets with 3/8 inch diameter perforations at 9/16 inch staggered centers. Manufacturer's standard powdercoat finish applied after metal is perforated.
 2. Manufacturer:
 - a. McNichols: www.mcnichols.com.
 - b. Substitutions: See Section 01 2513 - Product and Substitution Procedures, for administrative requirements.
- H. Miscellaneous Framing and Supports:
1. Provide miscellaneous steel framing and supports, as required to complete work.
 2. Fabricate miscellaneous units to sizes, shapes and profiles shown or, if not shown, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
 3. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.
- I. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; prime paint finish.

2.05 CAST IRON FABRICATIONS

- A. Manufacturers:
1. Neenah Foundry, a division of Neenah Enterprises, Inc: www.nfco.com.
 2. Duralast: www.ejco.com.
 3. US Foundry: www.usfoundry.com.
 4. Substitutions: See Section 01 2513 - Product Substitution Procedures.
- B. Cast iron plates with textured surface complying with accessibility building codes and ADA. Plates shall have integral lugs to assure solid attachment to concrete and method to fasten adjacent plates together.
1. Material: Cast iron; ASTM A48/A48M, Class 35 B (heavy duty).
 2. Finish: Natural.
- C. Cast Iron Tree Grates:
1. Material: Cast iron; ASTM A48/A48M.
 2. Finish: Natural.

2.06 CHAINLINK FENCING

- A. Manufacturers:
1. Master-Halco, Inc
 2. Merchants Metals
- B. Components:
1. Line Posts: 1.9 inch diameter

2. Corner and Terminal Posts: 2.38 inch diameter
 3. Gate Posts: 3 1/2" diameter
 4. Top and Brace Rail: 1.66 inch diameter, plain end, sleeve coupled
 5. Bottom Rail: 1.66 inch diameter, plain end, sleeve coupled
 6. Gate Frame: 1.66 inch diameter for welded fabrication
 7. Tension Wire: 6 gauge, 0.1920 inch thick steel, single strand
 8. Tie Wire: Aluminum alloy steel wire
- C. Materials:
1. Posts, Rails, and Frames:
 - a. ASTM A1011/A1011M, Designation SS; hot-rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi; zinc coating complying with ASTM F1043 and ASTM F1083.
 - b. Formed from hot-dipped galvanized steel sheet, ASTM A653/A653M, HSLAS, Grade 50, with G90 (Z275) zinc coating.
 - c. Line Posts: Type I round in accordance with FS RR-F-191/1D.
 - d. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round in accordance with FS RR-F-191/1D.
 - e. Comply with CLFMI CLF-PM0610.
- D. Manual Gates and Related Hardware:
1. Hardware for Single Swinging Gates: 180 degree hinges, 3 for gates taller than 60"; fork latch with gravity drop and padlock hasp.
 2. Hinges: finished to match fence components
 - a. Brackets: Round
 - b. Mounting: Center
 - c. Closing: Manual
 - d. Products:
 - 1) D&D Technologies USA, Inc; SHUT IT
 3. Mechanical Latches: Steel latch, with mounting bracket for a 1 5/8" diameter pipe post frame
 - a. Commercial heavy duty malleable fork latch, padlockable assembly
 - 1) Swing Direction: Both ways
 - 2) Mounting to Gate Frame: U-bolts
 - 3) Locking: Padlockable from one side
 - 4) Products:
 - (a) Jake Sales, Heavy Duty Chain Link Gate Malleable Fork Latches 1-3/8" x 1-7/8" Thru 1-7/8" x 4"
 - (b) Substitutions: See Section 01 6000
- E. Finishes:
1. All chainlink fence related items to be black vinyl coated or black powder coated

2.07 FINISHES - STEEL

- A. Prime paint steel items.
 1. Exceptions: Galvanize items to be embedded in concrete, items to be embedded in masonry, and items specified for factory finish.
 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.

- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.08 FINISHES - ALUMINUM

- A. Exterior Aluminum Surfaces: Class I color anodized.
- B. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick; light bronze.
- C. High Performance Organic Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system; color as indicated.
- D. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

2.09 ACCESSORIES

- A. Concrete Inserts:
 - 1. Threaded or wedge type; galvanized ferrous castings, either malleable iron, galvanized ferrous castings, cast steel; with steel bolts, washers and shims; hot-dip galvanized.
- B. Non-Shrink Non-Metallic Grout:
 - 1. Non-shrink, non-metallic grout recommended by manufacturer for types of applications indicated.
 - 2. Euclid (Euco N-S).
 - 3. Grace.
 - 4. Master Builders (Master Flow 713).
 - 5. Sonneborn (Sono-Grout).
 - 6. US Grout Co (Five Star Grout).
- C. Epoxy Grout (For exterior exposed, items e-g. rails set in concrete):
 - 1. Three-component grout by Brutem or equal.
- D. Fasteners:
 - 1. Provide nuts, bolts, wood screws, machine screws, toggle bolts, lag bolts, masonry anchorage devices, lock washers as required for application indicated and complying with applicable Federal standards. Hot-dip galvanize fasteners for exterior applications to comply with ASTM A153.
- E. Rough Hardware:
 - 1. Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Straight bolts and other stock rough hardware items are specified in Division 06 - Wood and Plastics sections.
 - 2. Manufacture or fabricate items of sizes, shapes and dimensions required. Furnish malleable iron washers for wood and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

2.10 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 5000

SECTION 05 5100
METAL STAIRS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Stairs with concrete treads.
- B. Structural steel stair framing and supports.
- C. Handrails and guards.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete fill in stair pans; mesh reinforcement for landings.
- B. Section 03 3000 - Cast-in-Place Concrete: Placement of metal anchors in concrete.
- C. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- D. Section 05 5000 - Metal Fabrications.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.
- C. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2017.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- G. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- H. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.
- I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.
- K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- L. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- M. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- N. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
- O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- P. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.

- Q. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
- R. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).
- S. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- T. SSPC-SP 2 - Hand Tool Cleaning; 1982 (Ed. 2004).

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Include the design engineer's seal and signature on each sheet of shop drawings.
- C. Design Data: As required by authorities having jurisdiction.
- D. Welders' Certificates.
- E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is certified under AISC 201.
- F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.
- C. Fabricator Qualifications:
 - 1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.
 - 2. A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
 - 3. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

PART 2 PRODUCTS

2.01 METAL STAIRS - GENERAL

- A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
 - 1. Regulatory Requirements: Provide stairs and railings complying with the most stringent requirements of local, state, and federal regulations; where requirements of Contract Documents exceed those of regulations, comply with Contract Documents.
 - 2. Handrails: Comply with applicable accessibility requirements of ADA Standards.
 - 3. Structural Design: Provide complete stair and railing assemblies complying with the applicable local code.
 - 4. Dimensions: As indicated on drawings.
 - 5. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
 - 6. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
 - 7. Separate dissimilar metals using paint or permanent tape.

- B. Metal Jointing and Finish Quality Levels:
 - 1. Commercial: Exposed joints as inconspicuous as possible, whether welded or mechanical; underside of stair not covered by soffit IS considered exposed to view.
 - a. Welded Joints: Intermittently welded on back side, filled with body putty, and sanded smooth and flush.
 - b. Welds Exposed to View: Ground smooth and flush.
 - c. Mechanical Joints: Butted tight, flush, and hairline.
 - d. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts.
 - e. Exposed Edges and Corners: Eased to small uniform radius.
 - f. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for satin or matte finish.
- C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.02 METAL STAIRS WITH CONCRETE TREADS

- A. Jointing and Finish Quality Level: Commercial, as defined above.
- B. Risers: Closed.
- C. Treads: Metal pan with field-installed concrete fill.
 - 1. Concrete Depth: 1-1/2 inches, minimum.
 - 2. Tread Pan Material: Steel sheet.
 - 3. Tread Pan Thickness: As required by design; 14 gage, 0.075 inch minimum.
 - 4. Concrete Reinforcement: None.
 - 5. Concrete Finish: Steel troweled.
- D. Risers: Same material and thickness as tread pans.
 - 1. Riser/Nosing Profile: Vertical riser with underside of nosing sloped up from bottom of tread pan at not less than 60 degrees from horizontal, with rounded top of nosing of minimum radius.
 - 2. Nosing Depth: Not more than 1-1/2 inch overhang.
 - 3. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch wide.
- E. Stringers: Rolled steel channels.
 - 1. Stringer Depth: 10 inches.
 - 2. End Closure: Sheet steel of same thickness as risers welded across ends.
- F. Landings: Same construction as treads, supported and reinforced as required to achieve design load capacity.
- G. Railings: Steel pipe railings.
- H. Finish: Shop- or factory-prime painted.
- I. Under Side of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.03 HANDRAILS AND GUARDS

- A. Wall-Mounted Rails: Round pipe or tube rails unless otherwise indicated.
 - 1. Outside Diameter: 1-1/4 inch, minimum, to 1-1/2 inches, maximum.
- B. Guards:
 - 1. Top Rails: Round pipe or tube rails unless otherwise indicated.
 - a. Outside Diameter: 1-1/4 inch, minimum, to 1-1/2 inches, maximum.
 - 2. Infill at Pipe Railings: Pipe or tube rails sloped parallel to stair.
 - a. Outside Diameter: 1 inch.
 - b. Material: Steel pipe or tube, round.
 - c. Vertical Spacing: Maximum 4 inches on center.
 - d. Jointing: Welded and ground smooth and flush.

3. End and Intermediate Posts: Same material and size as top rails.
 - a. Horizontal Spacing: As indicated on drawings.
 - b. Mounting: Welded to top surface of stringer.

2.04 MATERIALS

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500/A500M or ASTM A501/A501M structural tubing, round and shapes as indicated.
- C. Steel Plates: ASTM A6/A6M or ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
 1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
 2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
- F. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230 with G40/Z120 coating.
- G. Concrete Fill: Type specified in Section 03 3000.

2.05 ACCESSORIES

- A. Factory Fabricated Stair Tread and Nosing:
 1. Materials: Cast Aluminum.
 - a. Tread Abrasive: Cross-hatched silicon carbide abrasive 20 grit.
 - b. Finish: Natural sand cast finish.
- B. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
- C. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- D. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.06 SHOP FINISHING

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime Painting: Use specified shop- and touch-up primer.
 1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.
 2. Number of Coats: One.
- D. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A123/A123M.
 1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

- A. When field welding is required, clean and strip primed steel items to bare metal.
- B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

3.03 INSTALLATION

- A. Install components plumb and level, accurately fitted, free from distortion or defects.

- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
- F. Obtain approval prior to site cutting or creating adjustments not scheduled.
- G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION 05 5100

SECTION 05 7000
DECORATIVE METAL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Railing and guardrail assemblies.
- B. Glazed, ceiling mounted smoke baffle assemblies.

1.02 RELATED REQUIREMENTS

- A. Section 01 2300 - Alternates.
- B. Section 09 2116 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.

1.03 ALTERNATES

- A. See Section 01 2300 - Alternates, for product alternatives affecting this Section.
- B. **Alternate 4:** Provide and install cable guardrail system at loft edge in lieu of 3 foot high gypsum board wall.

1.04 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.
- D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2014.
- E. ASTM A555/A555M - Standard Specification for General Requirements for Stainless Steel Wire and Wire Rods; 2016.
- F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- G. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2009 (Reapproved 2015).
- H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- J. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013, with Editorial Revision.
- K. AWS C3.4M/C3.4 - Specification for Torch Brazing; 2016.
- L. AWS C3.5M/C3.5 - Specification for Induction Brazing; 2016 (Amended 2017).
- M. AWS C3.9M/C3.9 - Specification for Resistance Brazing; 2009.
- N. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- O. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Submit manufacturer's product data including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.
- C. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.

- D. Test Reports: Submit test reports from an independent testing agency showing compliance with specified design and performance requirements.
- E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in factory provided protective coverings and packaging.
- B. Protect materials against damage during transit, delivery, storage, and installation at site.
- C. Inspect materials upon delivery for damage. Repair damage to be indistinguishable from undamaged areas; if damage cannot be repaired to be indistinguishable from undamaged parts and finishes, replace damaged items.
- D. Prior to installation, store materials and components under cover, in a dry location.

1.08 WARRANTY

- A. Warranty: Manufacturer's standard one year warranty against defects in materials, fabrication, finishes, and installation commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 RAILING SYSTEMS

- A. Railing Systems - General: Factory- or shop-fabricated in design indicated, to suit specific project conditions, and for proper connection to building structure, and in largest practical sizes for delivery to site.
 - 1. Performance Requirements: Design and fabricate railings and anchorages to resist the following loads without failure, damage, or permanent set; loads do not need to be applied simultaneously.
 - a. Lateral Force: 75 lb minimum, at any point, when tested in accordance with ASTM E935.
 - b. Distributed Load: 50 lb/ft minimum, applied in any direction at the top of the handrail, when tested in accordance with ASTM E935.
 - c. Concentrated Loads on Intermediate Rails: 50 psf, minimum.
 - d. Concentrated Load: 200 lbs minimum, applied in any direction at any point along the handrail system, when tested in accordance with ASTM E935.
 - 2. Assembly: Join lengths, seal open ends, and conceal exposed mounting bolts and nuts using slip-on non-weld mechanical fittings, flanges, escutcheons, and wall brackets.
 - 3. Joints: Tightly fitted and secured, machined smooth with hairline seams.
 - 4. Field Connections: Provide sleeves to accommodate site assembly and installation.
 - 5. Welded and Brazed Joints: Make exposed joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
 - a. Ease exposed edges to small uniform radius.
 - b. Welded Joints:
 - 1) Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
 - 2) Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.
 - c. Brass/Bronze Brazed Joints:
 - 1) Perform torch brazing in accordance with AWS C3.4M/C3.4.
 - 2) Perform induction brazing in accordance with AWS C3.5M/C 3.5.
 - 3) Perform resistance brazing in accordance with AWS C3.9M/C3.9.
- B. Cable Railing System:

1. Description: Post and cable railing system.
2. Configuration: Guardrail only.
3. Stainless Steel Bar and Shape: Type 304 or Type 316 stainless steel.
 - a. Guardrail Post: 2 inch by 2 inch by 1/2 inch tee.
4. Cable: ASTM A555/A555M.
 - a. Fabricate from ASTM A666 stainless steel, Type 304 or Type 316.
 - b. Size: 3/16 inch diameter.
5. Fittings: Type 304 or Type 316 stainless steel, non-swedge.
6. Fasteners: Stainless steel.
7. Finishes:
 - a. Exposed Stainless Steel Pipe and Tubing: Brushed finish.
 - b. Exposed, Machined Stainless Steel Fittings: Brushed finish.
8. Fabrication:
 - a. Corners: Mitered and welded; grind smooth to match adjacent finish.
 - b. Exposed Joints: Butt tight and flush.
 - c. Splices: Provide interior sleeves; fasteners allowed at splice connections

2.02 SMOKE BAFFLE SYSTEM

- A. Smoke Baffle System: Glazed, ceiling-mounted smoke baffle in configuration similar to railings.
 1. Baffle Shoe: Aluminum, natural finish.
 2. Baffle Shoe Cladding: Manufacturer's standard stainless steel sheet.
 3. Anchors: Stainless steel bolts with plastic isolator sleeves.
 4. Glass: 1/2 inch clear tempered glass panels with polished edges.
 5. Stainless Steel Finish, Exposed Surfaces: No. 8 mirror finish.
 6. Basis of Design: C.R. Laurence Company, Inc; CRL-Blumcraft SB200 Two Piece Smoke Baffle System: www.crl-arch.com/#sle.

2.03 MATERIALS

- A. Aluminum Components: ASTM B221 or ASTM B221M.
 1. Clear Anodized Finish: Class I, AAMA 611 AA-M12C22A41 Clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.
- B. Stainless Steel Components:
 1. ASTM A666, Type 304.
 2. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.
 3. Stainless Steel Finish: Brushed finish.

2.04 ACCESSORIES

- A. Non-Weld Mechanical Fittings for Stainless Steel Railings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- B. Welding Fittings: Factory- or shop-welded from matching pipe or tube; joints and seams ground smooth.
- C. Anchors and Fasteners: Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 1. For anchorage to concrete, provide inserts to be cast into concrete for bolting anchors.
 2. For anchorage to masonry, provide brackets to be embedded in masonry for bolting anchors.
 3. For anchorage to stud walls, provide backing plates for bolting anchors.
 4. Exposed Fasteners: No exposed bolts or screws.
- D. Carbon Steel Bolts and Nuts: ASTM A307.
- E. Finish Touch-Up Materials: As recommended by manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate and site conditions are acceptable and ready to receive work.
- B. Verify field dimensions of locations and areas to receive work.
- C. Notify Architect immediately of conditions that would prevent satisfactory installation.
- D. Do not proceed with work until detrimental conditions have been corrected.
- E. Furnish components to be installed in other work to installer of that other work, including but not limited to blocking, sleeves, inserts, anchor bolts, embedded plates and supports for attachment of anchors.

3.02 PREPARATION

- A. Protect existing work.
- B. Review installation drawings before beginning installation. Coordinate diagrams, templates, instructions and directions for installation of anchorages and fasteners.
- C. Clean surfaces to receive units. Remove materials and substances detrimental to the installation.

3.03 INSTALLATION

- A. Comply with manufacturer's drawings and written instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects and with tight joints, except where necessary for expansion.
- C. Anchor securely to structure.
- D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
- E. Weld connections that cannot be shop welded due to size limitations.
 - 1. Weld in accordance with AWS D1.1/D1.1M.
 - 2. Match shop welding and bolting.
 - 3. Clean welds, bolted connections and abraded areas.
 - 4. Touch up shop primer and factory applied finishes.
 - 5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.
- F. Isolate dissimilar materials with bituminous coating, bushings, grommets or washers to prevent electrolytic corrosion.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

3.05 CLEANING

- A. Remove protective film from exposed metal surfaces.
- B. Metal: Clean exposed metal finishes with potable water and mild detergent, in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents or other substances that may damage the material or finish.

3.06 PROTECTION

- A. Protect installed components and finishes from damage after installation.
- B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.
 - 1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

END OF SECTION 05 7000

SECTION 05 7113
FABRICATED METAL SPIRAL STAIRS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Center support column, radial shaped treads.
- B. Spiral handrail.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
- B. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc; 2011.
- C. NAAMM AMP 510 - Metal Stairs Manual; 1992.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Shop Drawings: Indicate detailed stair configuration, support loads, supporting accessories and connections, floor opening details, required floor opening and stair height tolerances, and other measurements affecting the stair.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Include the design engineer's seal and signature on each sheet of shop drawings.
- C. Product Data: Provide details of stair components and connection details.
- D. Manufacturer's Instructions: Include complete assembly and anchorage requirements.
- E. Designer's Qualification Statement.
- F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
- C. Design custom stair under direct supervision of a Professional Structural Engineer experienced in design of products of this type and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fabricated Spiral Stairs:
 - 1. Paragon Stairs; Cape Cod: www.paragonstairs.com.
 - 2. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 FABRICATED SPIRAL STAIRS

- A. Comply with applicable building code for live loads applicable to work of this section.
- B. Nominal Stair Diameter: 60 inches.
- C. Baluster Attachment: To 3 treads.

2.03 COMPONENTS

- A. Tread Material: Steel, radial tread with nosing. .

- B. Column: Steel, with steel plate for base and top anchorage, drilled for attachment.
- C. Handrail: Steel.
- D. Balusters: Steel.

2.04 ACCESSORIES

- A. Attachments and Fasteners: Steel.
- B. Vertical Column Cap: Cast steel.
- C. Tubular Handrail Ends: Cast steel.

2.05 FABRICATION

- A. Fabricate stair of stock components to permit site assembly and installation.
- B. Assembly Fasteners: Concealed.
- C. Fabricate stairs to comply with NAAMM AMP 510, Class Commercial.

2.06 FINISHES

- A. Vertical Column: Smooth painted.
- B. Top Surface of Treads: Diamond plate painted.
- C. Underside and Edges of Treads and Risers: smooth painted.
- D. Handrail: painted.
- E. Balusters: painted.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are acceptable to suit stair assembly tolerances.
- B. Verify that supports are correctly positioned.

3.02 INSTALLATION

- A. Install stair assembly in accordance with manufacturer's instructions.
- B. Advise if field conditions exceed adjustment limits of attachments. Do not field cut or modify stair components.

3.03 TOLERANCES

- A. Comply with NAAMM AMP 510 requirements.

3.04 PROTECTION

- A. Do not permit traffic on stair after installation.

END OF SECTION 05 7113

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural dimension lumber framing.
 - 1. Stair framing.
- B. Non-structural dimensional lumber framing.
 - 1. Rough opening framing for doors and windows.
- C. Framing and hardware for storage lockers.
- D. Plywood panels.
- E. Roof-mounted curbs.
- F. Roofing nailers.
- G. Roofing cant strips.
- H. Preservative treated wood materials.
- I. Miscellaneous blocking for mechanical equipment.
- J. Miscellaneous framing and sheathing.
- K. Communications and electrical room mounting boards.
- L. Concealed wood blocking, nailers, and supports.
 - 1. Blocking for corner guards, grab bars, and miscellaneous equipment.
- M. Miscellaneous wood nailers, blocking, sleepers and furring strips.

1.02 RELATED SECTIONS

- A. Section 04 2000 - Unit Masonry: Setting sill anchor bolts and other anchors in masonry.
- B. Section 03 5400 - Self-Leveling Underlayment: Components that are part of fire rated and sound rated assemblies.
- C. Section 05 5000 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
- D. Section 06 2000 - Finish Carpentry.
- E. Section 07 5300 - Elastomeric Membrane Roofing.
- F. Section 07 62 00 - Sheet Metal Flashing and Trim.
- G. Section 07 9005 - Joint Sealers: Vapor and air sealing gaps in wood framing.
- H. Section 09 2116 - Gypsum Board Assemblies: Components that are part of fire rated and sound rated assemblies.
- I. Section 12 2113 - Louver Blinds.

1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2000.
- D. ASTM A 1008/A 1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability; 2002.

- E. ASTM A 1011/A 1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability; 2002.
- F. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- G. ASTM C 955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2000a.
- H. PS 1 - Structural Plywood; 2009.
- I. PS 20 - American Softwood Lumber Standard; 2010.
- J. Forest Stewardship Council; www.fscus.org. (If FSC lumber is used)

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials and fire-retardent treatment products.
- C. Submit wood treatment data including treatment plant's certification of compliance with indicated requirements

1.05 QUALITY ASSURANCE

- A. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.
- B. Regulatory Requirements: Comply with requirements for lumber and framing of each of the following agencies:
 - 1. Minnesota State Building Code.
 - 2. International Building Code.
 - 3. Minimum Property Requirements by the Federal Housing Authority.
 - 4. Minnesota Housing Finance Agency.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Cover wood products to protect against moisture at all times. Protect against exposure to weather and contact with damp or wet surfaces. Support stacked products (lumber, structural units, and panels) to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.07 PROJECT CONDITIONS

- A. Coordination: Fit carpentry work to other work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other work.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. Species: Spruce Pine Fir, unless otherwise indicated.
 - 2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
 - 3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
 - 4. End jointed (finger jointed) structural glued lumber products are acceptable. In fire rated assemblies, they must be stamped "HRA" (Heat Resistive Adhesive).

5. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
- B. Lumber fabricated from old growth timber is not permitted.
- C. Forest Stewardship Council (FSC) certified lumber is preferred, but not required.
- D. All sheathing resins and all adhesives and sealers shall be Low-VOC or No-VOC emitting products except in any case where a required warranty is voided by such product usage.
- E. All sheathing products shall meet APA Standards for emissions and shall contain no added urea-formaldehyde.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: To comply with PS 20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.
- B. Sizes: Nominal sizes as indicated on drawings, S4S. Provide actual sizes as required by PS 20, for moisture content specified for each use.
- C. Moisture Content: S-dry or MC19.
- D. Stud Framing (2 by 2 through 2 by 8):
 1. Grade: Refer to Structural Drawings.
- E. Stud Framing (2 by 2 through 2 by 6):
- F. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
 1. Species: Spruce-Pine-Fir (South).
 2. Grade: No. 2 or better.
- G. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 1. Lumber: S4S, No. 2 or Standard Grade.
 2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

- A. Subfloor/Underlayment Combination: APA PRP-108, Rated Sturd-I-Floor.
 1. Oriented Strand Board.
 2. Exposure Class: 1.
 3. Span Rating: 24 inches.
 4. Thickness: 23/32 inches, nominal.
 5. Edges: Tongue and groove.
- B. Roof Blocking: APA rated sheathing, Exposure 1, plywood.
- C. Exterior Plywood Backing Panels: 1/2" M.D.O. fire treated plywood. Exterior exposure.
- D. Other Applications:
 1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
 2. Exposed Interior Plywood: PS 1, A-D, interior grade.
 3. Other Locations: PS 1, C-D Plugged or better.
 4. Electrical Component Mounting at interior: APA rated sheathing, fire retardant treated.

2.04 MISCELLANEOUS MATERIALS

- A. Stair Treads: 1-1/4" full width particle board.
- B. Stair Risers: 1X pine board.
- C. Storage lockers: Provide plywood panels as indicated on drawings. Provide Stanley steel butt hinges and 4 1/2" adjustable staple safety hasp at each locker.

2.05 ACCESSORIES

- A. Fasteners and Anchors:
 1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2. All steel fasteners and connectors in contact with fire-retardant treated wood shall be G185 hot-dip galvanized or protected in accordance with the fire-retardant treated wood supplier's recommendations, whichever is more stringent.
 3. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
 4. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete.
- B. Rough Hardware: Provide rough hardware as necessary for the project including nails, bolts, anchors, corner bracing, joist hangers, truss hangers, and post base plates. Provide shear wall tie-downs as noted or detailed in structural drawings. Coordinate locations with anchor bolt placement. Hardware exposed to weather, in contact with ground, or in wet areas shall be hot-dipped galvanized. Framing anchors shall be not less than 18 gauge, by Simpson, Teco, or Cleveland.
 - C. Joist Hangers: Hot dipped galvanized steel, as indicated on plans.
 1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.
 - D. Safing Insulation: Thermafiber safing insulation by U.S.G. (ASTM 665 Type 1)
 - E. Acoustic Sealant: By Tremco, USG, or Pecora.
 - F. Miscellaneous backing for accessories and casework installation.
 - G. Padlock hasps for tenant storage plywood doors: Master Lock 704DPF.

PART 3 EXECUTION

3.01 PREPARATION

- A. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required. All exposed fasteners to be located in an orderly and logical pattern.
- D. Seal all joints in wood framing as detailed on the drawings to resist air infiltration and vapor migration between outside and/or untempered indoor spaces and tempered indoor spaces, between dwelling units and between dwelling units and surrounding non-dwelling unit spaces.

3.03 FRAMING INSTALLATION

- A. General: Framing shall comply with the IBC, "Manual of House Framing" by National Forest Products Association, the FHA Minimum Property Requirements (latest edition), the "Techniques of House Nailing" by the Forest Products Laboratory, and the Minnesota Housing Finance Agency.
- B. Securely attach carpentry work to substrate by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes. Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; predrill as required. Anchor and nail using the size

and number of nails noted in the U.B.C. or as recommended by the manufacturer. In addition, follow the requirements for pneumatically or mechanically driven staples, nails and fasteners, Report NER-272 by the Council of American Building Officials.

- C. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- D. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- E. Install structural members full length without splices unless otherwise specifically detailed.
- F. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.

3.04 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
- C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.
- D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- F. Provide the following specific non-structural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Wall brackets.
 - 3. Handrails.
 - 4. Grab bars.
 - 5. Towel and bath accessories.
 - 6. Wall-mounted door stops.
 - 7. Joints of rigid wall coverings that occur between studs.

3.05 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD

- A. In areas to be sided, coordinate with the Sider, the installation of a layer of weather-resistive barrier over wall sheathing prior to installation of windows and doors. All windows, doors, and sliding glass doors (if used) are to be fully jamb-flashed. Windows and sliding glass doors (if used) are to have full pan-flashing draining to the building exterior. All jamb and pan-flashing shall bond to, and be continuous, with the exterior weather barriers.
- B. Install all blocking and nailers as necessary for installation of wood handrails, blinds, shades, casework, cabinetry, shelves, frames, hardware and other accessories.

3.06 INSTALLATION OF CONSTRUCTION PANELS

- A. Subflooring/Underlayment Combination: Glue and nail to framing; staples are not permitted.
- B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
 - 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
 - 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.

3. Install adjacent boards without gaps.

3.07 TOLERANCES

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.
- C. Surface Flatness of Wall Sheathing: Install wall sheathing flat, within 1/4" in a 4 foot radius, free from any notable deflections or indentations.
- D. Variation from Plane (other than floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.08 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Assist testing lab in conducting field sound transmission tests (STC and IIC) of party wall assemblies to verify conformance to design and code requirements. Test as soon as practical during construction once two adjacent units have received gypsum board and been taped. Provide temporary finish flooring for testing. Cover miscellaneous mechanical/electrical openings. Conduct tests according to City standards as well as ASTM E336 "Recommended Method for Measurement of Airborne Sound Insulation in Buildings", and ASTM E90. Correct any deficiencies noted.

3.09 CLEANING

- A. Waste Disposal: Comply with the requirements of Section 01 7419 - Construction Waste Management and Disposal.
 1. Do not burn scrap on project site.
 2. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

END OF SECTION 06 1000

SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install the following finish carpentry items:
 - 1. Jamb trim.
 - 2. Handrails.
 - 3. Stair skirt boards.
 - 4. Wall caps and other finished woodwork.
 - 5. Wood closet shelf and rod.
 - 6. Corner guards.
 - 7. Interior trim.
- B. Installation of access panels at bathtubs.
- C. Products Installed But Not Supplied Under the Work of This Section:
 - 1. Doors and Door Hardware.
 - 2. Residential casework (cabinets).
 - 3. Counters.
 - 4. Fire extinguishers and cabinets.
 - 5. Vinyl-Coated Storage shelving.
 - 6. Toilet, bath, and laundry accessories.
 - 7. Access panels at fire-rated locations.
 - 8. FRP panels.

1.02 RELATED SECTIONS

- A. Section 01 2300 - Alternates.
- B. Section 05 5000 - Metal Fabrications: Concealed floating shelving brackets.
- C. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- D. Section 08 1416 - Flush Wood Doors.
- E. Section 08 3113 - Access Doors and Panels.
- F. Section 08 7100 - Door Hardware.
- G. Section 09 77 00 - Fiberglass Reinforced Panels (FRP)
- H. Section 09 9000 - Painting and Coating: Painting and finishing of finish carpentry items.
- I. Section 10 2800 - Toilet, Bath and Laundry Accessories.
- J. Section 10 4416 - Fire Extinguishers and Accessories.
- K. Section 10 5615 - Vinyl-Coated Storage Shelving.
- L. Section 12 3530 - Residential Casework: Shop fabricated kitchen and bath cabinet work; shop fabricated window sills.
- M. Section 12 3600 - Countertops.

1.03 ALTERNATES

- A. See Section 01 2300 - Alternates for product alternatives affecting this section.
- B. **Alternate 1:** Provide and install pre-hung wood doors and frames in lieu of drywall frames and site-installed wood doors at interior dwelling unit doors. Wood casing shall be 1x3 paint-grade Poplar with radius at exposed corners.

1.04 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.

- C. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2009.
- D. PS 1 - Structural Plywood; 2009.
- E. PS 20 - American Softwood Lumber Standard; 2010.
- F. FSC-US; Forest Stewardship Council certified products, www.findfsc.org.(ONLY IF FSC LUMBER IS USED)
- G. WMMPA WM Series - Softwood Moulding Patterns catalog; current edition.
- H. ANSI A208.1 - American National Standard for Medium Density Fiberboard for Interior Use; current edition.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data:
 - 1. Provide instructions for attachment hardware and finish hardware.
- C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
- D. Samples: Submit two samples of millwork 6 inch long.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Custom grade.
- B. Grade materials in accordance with the following:
 - 1. Lumber Grading Agency: Certified by ALSC.
 - 2. Plywood: Certified by the American Plywood Association.
 - 3. Hardwood Lumber Grading: NHLA Grading Rules.
- C. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- D. Quality Certification:
 - 1. Provide labels or certificates indicating that the work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
 - 2. Provide designated labels on shop drawings as required by certification program.
 - 3. Provide designated labels on installed products as required by certification program.
 - 4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Interior Woodwork Items:
 - 1. Alternate Bid Items: Moldings, Casings, and Miscellaneous Trim: Material and finish as described elsewhere.

2.02 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.

2.03 LUMBER MATERIALS

- A. Softwood Lumber: pine species, plain sawn, maximum moisture content of 6 percent; with vertical grain.
- B. Hardwood Lumber: Maple species, rift sawn, maximum moisture content of 6 percent; with vertical grain.

2.04 SHEET MATERIALS

- A. Softwood Plywood, Exposed to View: Face species as indicated, plain sawn, veneer core; PS 1 Grade A-B, glue type as recommended for application.
- B. Hardwood Plywood: Face species maple, plain sawn, book matched, veneer core; HPVA HP-1, Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.

2.05 COMPONENTS

- A. Interior Standing and Running Trim; Casings and Other Trim:
 - 1. Millwork material and finish:
 - a. Inside units: Poplar with painted field finish.
 - 1) Color: To be selected by Architect.
 - 2. Units:
 - a. Casing: 1x3 rectangular profile with radius at exposed corners.
 - b. Finish: Factory primed and painted.
 - 3. Miscellaneous Trim shown and noted in drawings: 1x4, 1x12, others as noted on the drawings.
- B. Stair Skirts, Handrails and Wall Caps:
 - 1. Stair handrails: Round 1 5/8" x 1 3/4" Prefinished (clear) Grade A Poplar suitable for painting.
 - a. Mounting brackets: Satin chrome or brushed stainless steel, shaft with radius bracket arm, screw plate railing connector canted to slope of railing with conceal fasteners to wall. Approximate size 2 3/8 x 2/3/8 inches.
 - 2. Wall caps to be Painted grade A Poplar 3/4" (nominal) thickness.
 - 3. Stair skirts to be of same wood species rectangular profile with radius top exposed corner.
- C. Corner Guards:
 - 1. Stainless with flanges for screw into stud at all outside corners in ANSI A117.1 Type A (accessible) units: Hiawatha "SAF-T-Guard Stainless Steel Corner Guards," www.hiawathainc.com, Type 304 S.S., 18 gauge, #4 Satin Finish. Size: 48" length, 1-1/2" wings, 90 degrees, 1/8" radius, countersunk screw holes and screws.

2.06 FASTENINGS

- A. Provide nails, screws and other anchoring devices of type, size, material and finish suitable for intended use and required to provide secure attachment, concealed where possible. Hot-dip galvanize fasteners for work exposed to exterior and high humidity to comply with ASTM A153.

2.07 ACCESSORIES

- A. Lumber for Shimming, Blocking, and Furring: Softwood lumber of species specified in Section 06 1000, for blocking and furring, etc.
- B. Primer: Alkyd primer sealer.
- C. Wood Filler: Solvent base, tinted to match surface finish color.

2.08 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.
- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.09 FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- D. Field finish all materials in accordance with finish specified and Section 09 9000 - Painting and Coating.
- E. Seal internal surfaces and semi-concealed surfaces. Brush apply only.
- F. Prime paint surfaces in contact with cementitious materials.
- G. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

- A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.
- D. Install casing at jambs and head of all doors.
- E. Anchor finish carpentry work securely to supports and substrates, using concealed fasteners and blind nailing where possible. Use fine finishing nails for exposed nailing except as indicated, countersunk and filled flush with finished surface. Make exterior joints water resistant by careful fitting. Use double dipped galvanized nails to nail exterior trim. Exterior trim to be pre-primed on all sides. Prime end cuts during installation. Finish work shall be free of defects including hammer marks. Exposed edges shall be coped and mitered. Miter and return handrail ends to the wall.
- F. Installation of Standing and Running Trim:
 - 1. Install with minimum number of joints possible, using full-length pieces from maximum length of lumber available. Cope at returns, miter at corners to produce tight fitting joints. Use scarf joints for end-to-end joints.
 - 2. Stair handrails to have mitered corners to return to wall. Mounting brackets to be approximately 48" o.c. horizontally. All corners and fasteners to be smooth.

3.03 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: See Section 09 9000 - Painting and Coating.
- C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.04 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06 2000

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Batt insulation in interior wall, ceiling and floor construction.
- B. Batt insulation for filling unit separation walls.

1.02 RELATED SECTIONS

- A. Section 06 1000 - Rough Carpentry: Supporting construction for batt insulation.
- B. Section 07 8400 - Firestopping: Fire stopping sealant and safing insulation.
- C. Section 09 2116 - Gypsum Board Assemblies.

1.03 REFERENCE STANDARDS

- A. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- C. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.
- D. RESNET Standards; <http://resnet.us/standards/mortgage/default.htm>

1.04 PERFORMANCE REQUIREMENTS

- A. Fire Performance: Provide insulation with fire performance characteristics indicated per ASTM E119, ASTM E84 and E136, as applicable, and which correspond to products listed in UL "Fire Resistance Directory" or "Building Materials Directory".

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

1.06 SEQUENCING

- A. Sequence work to ensure fireproofing and firestop materials are in place before beginning work of this section.

PART 2 PRODUCTS

2.01 BATT INSULATION MATERIALS

- A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
- B. Acceptable Manufacturers:
 - 1. CertainTeed Corporation: www.certainteed.com.
 - 2. Johns Manville: www.jm.com.
 - 3. Owens Corning Corp: www.owenscorning.com.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- C. Batt Insulation: ASTM C 665; preformed batt; friction fit, conforming to the following:
 - 1. Material: Glass fiber.
 - 2. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
 - 3. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.

4. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
5. Formaldehyde Content: Zero.
6. Facing: Unfaced, except where not backed by vapor retarder, provide batts with unreinforced kraft facing on one side.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation .
- B. Verify substrate surfaces are flat, free of irregularities.
- C. Verify mechanical, electrical and other systems within walls that have been installed and tested.

3.02 BATT INSTALLATION

- A. Install insulation in accordance with manufacturer's instructions.
- B. Insulation at unit separation walls: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions. Install without gaps or voids. Do not compress insulation.
- C. Install in floor/ceiling joist assemblies at party walls between units and around penetrations in top plates at the attic level.
- D. Fill voids in framing at door and window frames, lintels, headers, blocking and other exterior wall and party wall void locations. Secure insulation in place as necessary.
- E. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- F. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Coordination of Air Barrier Association of America (ABAA) Tests and Inspections:
 1. Provide testing and inspection required by ABAA Quality Assurance Program (QAP).
 2. Notify in ABAA writing of schedule for air barrier work, and allow adequate time for testing and inspection.
 3. Cooperate with ABAA testing agency.
 4. Allow access to air barrier work areas and staging.

3.04 FIELD QUALITY CONTROL

- A. Notify the Architect when work is ready to inspect (prior to backfilling and covering with gypsum board).

3.05 PROTECTION OF FINISHED WORK

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 2100

SECTION 07 2119
FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Foamed-in-place insulation at junctions of dissimilar wall and roof materials to achieve a thermal and air seal .

1.02 RELATED SECTIONS

- A. Section 06 1000 - Rough Carpentry.

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.
- C. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.
- D. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
- B. Applicator Qualifications: Company specializing in performing work of the type specified, with minimum three years documented experience.
- C. Air Barrier Association of America (ABAA) Evaluated Materials Program (EAP); www.airbarrier.org/sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.05 FIELD CONDITIONS

- A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Insulation: Closed-cell polyurethane type conforming to ASTM C 1029.
 - 1. Manufacturer: BASF; Product: Comfort Foam 178: www.basf-pfe.com.
 - 2. Density: 2.15 lb/cu ft, when tested in accordance with ASTM D 1622.
 - 3. Surface Burning Characteristics: Flame spread/Smoke developed index of 25 / 350, when tested in accordance with ASTM E 84.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 ACCESSORIES

- A. Primer: As required by insulation manufacturer.
- B. Overcoat: Intumescent coating of type recommended by insulation manufacturer and as required to comply with applicable codes.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify work within construction spaces or crevices is complete prior to insulation application.
- B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation adhesion.

3.02 PREPARATION

- A. Mask and protect adjacent surfaces from over spray or dusting.
- B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

- A. Apply insulation in accordance with manufacturer's instructions.
- B. Spray to seal gaps at plates, joints between materials, and around penetrations.

3.04 FIELD QUALITY CONTROL

- A. Inspection will include verification of insulation and overcoat thickness and density.

3.05 PROTECTION

- A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION 07 2119

**SECTION 07 2500
WEATHER BARRIERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vapor Retarders: Materials to make interior walls water vapor resistant and air tight.
 - 1. Interior Unit Bounding Walls and Ceilings: Materials to make dwelling unit interior wall perimeters, joints between interior dwelling walls and ceiling, and joints around frames of openings in interior walls water vapor-resistant and air-tight.

1.02 RELATED REQUIREMENTS

- A. Section 01 2300 - Alternates.

1.03 ALTERNATES

- A. See Section 01 2300 - Alternates for Alternates affecting this section.
- B. **Alternate 5:** Install vapor barrier on one side of unit separation walls.

1.04 DEFINITIONS

- A. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
 - 1. Water Vapor Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) = 1 perm.

1.05 REFERENCE STANDARDS

- A. ASTM D4397 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications; 2016.

1.06 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples, for administrative requirements for submittal procedures.
- B. Product Data: Provide data on material characteristics.
- C. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.
- D. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

1.07 QUALITY ASSURANCE

- A. Air Barrier Association of America (ABAA) Evaluated Materials Program (EAP); www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.

1.08 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES

- A. Interior Vapor Retarder:
 - 1. On dwelling-side face of studs of interior walls, under cladding, use mechanically fastened vapor retarder sheet.
 - a. Both sides of dwelling unit separation walls.
 - b. Dwelling unit side of walls separating dwelling units from other interior spaces.

2.02 VAPOR RETARDER MATERIALS (AIR BARRIER AND WATER-RESISTIVE)

- A. Vapor Retarder Sheet Type ____: ASTM D4397 polyethylene film, clear.
 - 1. Thickness: 6 mil, 0.006 inch.

2. Water Vapor Permeance: As required by referenced standard for thickness specified.
3. Seam and Perimeter Tape: Polyethylene self adhering type, 2 inches wide, compatible with sheet material.

2.03 ACCESSORIES

- A. Vapor Retarder Sealants, Tape and Accessories for sealing vapor retarder and sealing vapor retarder to adjacent surfaces and substrates.
 1. Coated polyester film with acrylic adhesive backing; pressure sensitive as specified or as recommended by weather barrier manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept the work of this section.

3.02 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive adhesives in accordance with manufacturer's instructions.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions.
- B. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- C. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.
- D. Mechanically Fastened Sheets - Vapor Retarder On Interior:
 1. When insulation is to be installed in assembly, install vapor retarder over insulation.
 2. Install continuous air-tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
 3. In interior stud-framed party walls between units, other walls separating dwelling units from other tempered interior spaces and at roof joists/trusses, attach sheet seal to inside stud faces with mechanical fasteners. Lap edges 16" over stud/joist faces, seal laps with tape. Seams over a single stud/joist face must be sealed between sheet seal layers with approved sealant. Lap ends onto adjacent construction; seal ends with sealant.
 4. At window, door, and any other penetration or openings install sheet seal between frame and adjacent wall seal material and attach with tape. Seal laps with sealant. Position lap seal over firm bearing. Exterior weather barrier must extend in at head, jamb, and sill and interior vapor retarder must be sealed to it.
 5. All tears and punctures must be carefully patched with poly extending minimum 16" beyond tear and all edges sealed with polyethylene tape or sealant.
 6. Install Weather Resistant Membrane in lieu of Vapor Retarder behind water resistant gypsum board at exterior walls of bathrooms and as indicated on drawings.

3.04 FIELD QUALITY CONTROL

- A. Owner's Inspection and Testing: Cooperate with Owner's testing agency.
 1. Allow access to work areas and staging.
 2. Notify Owner's testing agency in writing of schedule for work of this section to allow sufficient time for testing and inspection.
 3. Do not cover work of this section until testing and inspection is accepted.
- B. Do not cover installed weather barriers until manufacturer's representative has inspected its installation or otherwise approves covering of installed weather barrier.
- C. Take digital photographs of each portion of the installation prior to covering up.

3.05 PROTECTION

- A. Protect sheet materials from puncture.

END OF SECTION 07 2500

SECTION 07 5300
ELASTOMERIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Repair and modification of existing membrane roof.
- B. Elastomeric roofing membrane, mechanically fastened conventional and adhered conventional application.
- C. Flashings.
- D. Roofing stack boots and walkway pads.

1.02 REFERENCE STANDARDS

- A. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2013.

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact.
- B. Store materials in weather protected environment, clear of ground and moisture.
- C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

1.06 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above ____ degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
- E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. EPDM Membrane Materials:
 - 1. Carlisle Roofing Systems, Inc: www.carlisle-syntec.com/#sle.
 - 2. Firestone Building Products, LLC: www.firestonebpco.com/#sle.
 - 3. GenFlex Roofing Systems, LLC: www.genflex.com/#sle.
 - 4. Versico Roofing Systems; VersiGard EPDM: www.versico.com/#sle.

5. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 ROOFING - UNBALLASTED APPLICATIONS

- A. Elastomeric Membrane Roofing: One ply membrane, fully adhered.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane: Ethylene-propylene-diene-monomer (EPDM); non-reinforced; complying with minimum properties of ASTM D4637/D4637M.
 1. Thickness: 0.060 inch (60 mil).
 2. Color: Black.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Flexible Flashing Material: Same material as membrane; complying with the following:
 1. Thickness: 60 mil.
 2. Tensile Strength: 1,200 psi.
 3. Elasticity: 50 percent with full recovery without set.
 4. Color: Black.
- D. Separation Sheet: Sheet polyethylene; 2 mil thick.

2.04 ACCESSORIES

- A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- B. Membrane Adhesive: As recommended by membrane manufacturer.
- C. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- D. Thinners and Cleaners: As recommended by adhesive manufacturer, compatible with membrane.
- E. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
 1. Walkway Pads: Rubber, 30 x 30 x 0.30 inch, standard manufacturer finish.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck surfaces are dry and free of snow or ice.
- C. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 MEMBRANE APPLICATION

- A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
- B. Shingle joints on sloped substrate in direction of drainage.
- C. Fully Adhered Application: Apply adhesive to substrate at rate of ____ gal/square. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.
- D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. At intersections with vertical surfaces:
 1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
 2. Fully adhere flexible flashing over membrane and up to nailing strips.
- F. Around roof penetrations, seal flanges and flashings with flexible flashing.
- G. Coordinate installation of roof drains and sumps and related flashings.

3.03 FINISHING UNBALLASTED SURFACES

- A. Install walkway pads. Space pad joints to permit drainage.

3.04 CLEANING

- A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- B. Remove bituminous markings from finished surfaces.
- C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.
- D. Repair or replace defaced or damaged finishes caused by work of this section.

3.05 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION 07 5300

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items:
 - 1. Flashings.
 - 2. Window, door and louver head flashing.
 - 3. Sill flashing (above masonry/stone).
 - 4. Cap flashing at cornice.
- B. Sealants for joints within sheet metal fabrications.

1.02 RELATED SECTIONS

- A. Section 04 2000 - Unit Masonry: Metal flashings embedded in masonry.
- B. Section 04 4200 - Exterior Stone Cladding.
- C. Section 06 1000 - Rough Carpentry: Wood nailers for sheet metal work.
- D. Section 06 1000 - Rough Carpentry: Field fabricated roof curbs.
- E. Section 07 5300 - Elastomeric Membrane Roofing.
- F. Section 07 9005 - Joint Sealers.
- G. Section 08 4313 - Aluminum-Framed Storefronts.
- H. Section 08 5113 - Aluminum Windows.
- I. Section 08 5123 - Steel Windows.
- J. Section 09 9000 - Painting and Coating.

1.03 REFERENCE STANDARDS

- A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2015.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- D. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012).
- E. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Samples: Submit two samples 6 x 6 inch in size illustrating metal finish color.

1.05 PERFORMANCE REQUIREMENTS

- A. Installation of flashing and sheet metal work is to be water-tight/weatherproof.

1.06 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise indicated.

1.07 PRE-INSTALLATION MEETING

- A. Conduct pre-installation meeting with manufacturer's representative, Owner, Architect, building official (invited) and other necessary parties to verify product requirements, substrate conditions, manufacturer's installation instructions, manufacturer's warranty requirements, and job-specific conditions as indicated in documents.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, 0.028 inch thick base metal, shop pre-coated with modified silicone coating.
 - 1. Modified Silicone Polyester Coating: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.

2.02 ACCESSORIES

- A. Fasteners: Same material and finish as flashing metal .
- B. Primer: Zinc chromate type.
- C. Protective Backing Paint: Zinc molybdate alkyd.
- D. Sealant: Type; one-part urethane specified in Section 07 9005 - Joint Sealers.
- E. Miscellaneous: Provide flashing at miscellaneous locations as detailed or as necessary to provide a water and weather-tight installation. Provide prefinished aluminum drip cap at window heads, door heads, exterior wall base trim, and other exposed locations as necessary.

2.03 FABRICATION

- A. General: Shop fabricate work to greatest extent possible, comply with details shown and with applicable requirements of SMACNA "Architectural Sheet Metal Manual", the "Roofing and Waterproofing Manual" by NRCA, and other recognized industry practices. Fabricate for waterproof and weather resistant performance; with expansion provisions for running work, sufficient to permanently prevent leakage, damage or deterioration of the work. For work to fit substrates. comply with material manufacturers instructions and recommendations. Form exposed sheet metal work without excessive oil-canning effect, buckling and tool marks, true to line and levels as indicated, with exposed edges folded back to form hems. Secure flashings in place using concealed fasteners.
- B. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- C. Form pieces in longest possible lengths.
- D. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- E. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- F. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- G. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

2.04 ACCESSORIES

- A. Fasteners: Galvanized steel, with soft neoprene washers.
- B. Primer: Zinc chromate type.
- C. Concealed Sealants: Non-curing butyl sealant.
- D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
- E. Plastic Cement: ASTM D4586/D4586M, Type I.
- F. Reglets: Recessed type, galvanized steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Before starting work, verify dimensions. Examine adjoining work. Check for bowed surfaces, and similar conditions which may be possible moisture problems or result in an uneven surface for siding or trim.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.
- C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

- A. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal metal joints watertight.
- E. Provide for separation of dissimilar metals or corrosive substrates by coating concealed surfaces with bituminous coating or other permanent separation as recommended by manufacturer/fabricator. Provide sawcut reglets as necessary for complete installation.
- F. Provide for thermal expansion of running sheet metal work, by overlaps or expansion joints in fabricated work. Seal moving joints in metal work with elastomeric sealants, complying with FS SS-T-00227, -00230, or -001543. Space joints at intervals of not more than 50'.

3.04 CLEANING

- A. Upon completion, all work shall be cleaned.

END OF SECTION 07 6200

SECTION 07 7200
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Curbs.
- B. Equipment rails.
- C. Non-penetrating pedestals.

1.02 REFERENCE STANDARDS

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.

PART 2 PRODUCTS

2.01 ROOF CURBS

- A. Roof Curbs Mounting Assemblies: Factory fabricated hollow sheet metal construction, internally reinforced, and capable of supporting superimposed live and dead loads and designated equipment load with fully mitered and sealed corner joints welded or mechanically fastened, and integral counterflashing with top and edges formed to shed water.
 - 1. Roof Curb Mounting Substrate: Curb substrate consists of flat roof deck sheathing with insulation.
 - 2. Sheet Metal Material:
 - a. Galvanized Steel: Hot-dip zinc coated steel sheet complying with ASTM A653/A653M, SS Grade 33; G60 coating designation; 18 gage, 0.048 inch thick.
 - 3. Provide layouts and configurations indicated on drawings.
- B. Curbs Adjacent to Roof Openings: Provide curb on each side of opening, with top of curb horizontal for equipment mounting.
 - 1. Provide preservative treated wood nailers along top of curb.
 - 2. Insulate inside curbs with 1-1/2 inch thick fiberglass insulation.
- C. Equipment Rail Curbs: Straight curbs on each side of equipment, with top of curbs horizontal and level with each other for equipment mounting.
 - 1. Provide preservative treated wood nailers along top of rails.
 - 2. Height Above Finished Roof Surface: 8 inches, minimum.

2.02 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES

- A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.
 - 1. Design Loadings and Configurations: As required by applicable codes.
 - 2. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 - 3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
 - 4. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.
- B. Non-Penetrating Pedestals: Steel pedestals with square, round, or rectangular bases.
 - 1. Bases: High density polypropylene.
 - 2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 - 3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

END OF SECTION 07 7200

SECTION 07 8400
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping materials and firestopping of all penetrations and interruptions to fire rated assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED SECTIONS

- A. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.
- B. Division 23 for Mechanical specifications for firestopping of mechanical work.
- C. Division 26 for Electrical specifications for firestopping of electrical work.

1.03 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops; 2013a.
- B. ITS (DIR) - Directory of Listed Products; current edition.
- C. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- D. UL (FRD) - Fire Resistance Directory; current edition.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics.
- C. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- D. Certificate from (AHJ) Authority Having Jurisdiction indicating approval of materials before they are used.

1.05 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the specified fire ratings when tested in accordance with methods indicated.
 - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
 - 2. Current evaluation reports published by CABO, ICBO, or BOCA will be considered as constituting an acceptable test report.
 - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Installer Qualifications: Company specializing in performing the work of this section.

1.06 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for three days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 FIRESTOPPING - GENERAL REQUIREMENTS

- A. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

2.02 FIRESTOPPING SYSTEMS

- A. Firestopping: Any material meeting requirements.

1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E 814 that has F Rating equal to fire rating of penetrated assembly of building's assemblies and that meets all other specified requirements.

2.03 MATERIALS

- A. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant; conforming to the following:
 1. Durability and Longevity: Permanent.
 2. Color: Manufacturer's standard color.
 3. Manufacturers:
 - a. A/D Fire Protection Systems Inc: www.adfire.com.
 - b. 3M Fire Protection Products: www.3m.com/firestop.
 - c. Specified Technologies, Inc: www.stifirestop.com.
 - d. Rectorseal : www.rectorseal.com.
 - e. Hilti: www.us.hilti.com.
- B. Foam Firestopping: Single component silicone foam compound; conforming to the following:
 1. Durability and Longevity: Permanent.
 2. Color: Manufacturer's standard color.
 3. Manufacturers:
 - a. 3M Fire Protection Products: www.3m.com/firestop.
 - b. Specified Technologies, Inc: www.stifirestop.com.
 - c. Hilti: www.us.hilti.com.
 4. Durability and Longevity: Permanent.
 5. Color: Dark grey.
- C. Fiber Firestopping: Mineral fiber insulation used in conjunction with elastomeric surface sealer forming airtight bond to opening; conforming to the following:
 1. ASTM C 665, Type 1.
 2. Durability and Longevity: Permanent.
 - a. Thermafiber, Inc: www.thermafiber.com.
 - b. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- D. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to arrest liquid material leakage.

3.03 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Install labeling required by code.

3.04 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 07 8400

SECTION 07 9005
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants and joint backing, including, but not limited to:
 - 1. Interior and exterior joints at all windows, door frames, louvers, lintels, and grilles.
 - 2. Joints at lavatories, toilets, sinks, and showers.
 - 3. Masonry expansion and control joints.
 - 4. Saw cut control joints in concrete topping and concrete slabs.
 - 5. Joints at wood trim at exterior.
 - 6. Joints in stonework.
 - 7. Joints at counter tops.
 - 8. Under exterior door thresholds.
 - 9. Interior window frames where gypsum board returns to window.
 - 10. Joints at plumbing and electrical penetrations in exterior and party walls.
 - 11. Joints between door frames, side lites, louvers, grilles, and other frames in interior walls and surrounding construction.
 - 12. Joints of dissimilar materials on exterior walls.

1.02 RELATED SECTIONS

- A. Section 03 3000 - Cast-in-Place Concrete: Sealant for joints in concrete.
- B. Section 04 2000 - Unit Masonry.
- C. Section 04 4200 - Exterior Stone Cladding.
- D. Section 04 7200 - Cast Stone Masonry.
- E. Section 06 1000 - Rough Carpentry: Acoustical sealant at framing.
- F. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.
- G. Section 07 6200 - Sheet Metal Flashing and Trim: Sealant in conjunction with joints between flashing and surrounding construction.
- H. Section 07 8400 - Firestopping: Firestopping sealants.
- I. Section 09 2116 - Gypsum Board Assemblies: Acoustic sealant at partitions.

1.03 REFERENCE STANDARDS

- A. ASTM C834 - Standard Specification for Latex Sealants; 2014.
- B. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- C. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov; current edition.
- D. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.

1.04 PERFORMANCE REQUIREMENTS

- A. Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under service and application conditions, as demonstrated by testing and field experience.

1.05 SUBMITTALS

- A. Product Data: Provide data indicating sealant chemical characteristics.
- B. Samples: Submit two samples, 1/4 x 2 inch in size illustrating sealant colors for selection.
- C. All products are to be low-VOC emitting products and must comply with Regulation 8, Rule 51 of the Bay Area Air Quality Management District.

1.06 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07 COORDINATION

- A. Coordinate the work with all sections referencing this section.

1.08 WARRANTY

- A. See Section 01 7700 - Closeout Procedures for additional warranty requirements.
- B. Correct defective work within a one year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sanitary Silicone Sealants:
 - 1. Pecora Corporation; Product "898": www.pecora.com. VOC Content: 40 g/L.
 - 2. BASF Construction Chemicals, Inc; Product "Omniplus": www.chemrex.com. VOC Content: 0 g/L.
 - 3. Tremco, Inc; Product "Tremsil 200": www.tremcosealants.com. VOC Content: 3 g/L.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- B. Weatherproofing Silicone Sealants:
 - 1. Pecora Corporation; Product "895 NST": www.pecora.com. VOC Content: <100 g/L.
 - 2. Tremco, Inc; Product "Tremsil 600": www.tremcosealants.com. VOC Content: 8 g/L.
 - 3. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- C. One Part - Polyurethane Sealants:
 - 1. Pecora Corporation; Product "Dynatrol I-XL": www.pecora.com. VOC Content: <100 g/L.
 - 2. BASF Construction Chemicals, Inc; Product "NP1": www.chemrex.com. VOC Content: 43 g/L.
 - 3. Tremco, Inc; Product "Dymonic FC": www.tremcosealants.com. VOC Content: 105 g/L.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- D. Two Part - Polyurethane Sealants:
 - 1. Pecora Corporation; Product "Dynatrol II": www.pecora.com. VOC Content: <25 g/L.
 - 2. BASF Construction Chemicals, Inc; Product "NP2": www.chemrex.com. VOC Content: 53-80 g/L.
 - 3. Tremco, Inc; Product "Dymeric 240 FC": www.tremcosealants.com. VOC Content: 35 g/L.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- E. Butyl Sealants:
 - 1. Pecora Corporation; Product "BC-158": www.pecora.com. VOC Content: <250 g/L.
 - 2. Tremco, Inc; Product "Butyl Sealant": www.tremcosealants.com. VOC Content (when not used in cartridges): 226 g/L.
 - 3. BASF Construction Chemicals, Inc.; Product "Sonolac": www.chemrex.com. VOC Content: 41 g/L.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- F. Acrylic Emulsion Latex Sealants:
 - 1. Pecora Corporation; Product "AC-20": www.pecora.com. VOC Content: 31 g/L.
 - 2. Tremco, Inc; Product "Tremflex 834": www.tremcosealants.com. VOC Content: 11 g/L.
 - 3. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 SEALANTS

- A. All Adhesives: Provide products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No. 1168. All caulks and sealants must comply with Regulation 8, Rule 51, of the Bay Area Air Quality Management District.
- B. Sealants and Primers - General: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.

- C. Weatherproofing - General Purpose Exterior Sealant: Weatherproofing Silicone; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component.
 - 1. Applications use for:
 - a. Interior joints at penetrations in vapor barrier.
 - b. Seal openings of electrical boxes in exterior walls.
- D. Acrylic Emulsion Latex: ASTM C834, single component, non-staining, non-bleeding, non-sagging.
 - 1. Color: Standard colors matching finished surfaces, Type OP (opaque).
 - 2. Applications use for:
 - a. Interior joints around windows, doors, and trim.
- E. Butyl Sealant: ASTM C920, Grade NS, Class 12-1/2, Uses NT, M, A, G, O; single component, solvent release, non-skinning, non-sagging.
 - 1. Color: Standard colors matching finished surfaces.
 - 2. Applications use for:
 - a. Beneath thresholds and sill plates.
- F. One Part - Nonsag Polyurethane Sealant: ASTM C 920, Grade NS, Class 25, Uses T, I, M, A, G, O; single component, chemical curing, non-staining, non bleeding, non-sagging type.
 - 1. Color: Standard colors matching finished surfaces.
 - 2. Applications use for:
 - a. Joints in horizontal surfaces of concrete and between concrete, metal, or masonry.
- G. Two Part - Nonsag Polyurethane Sealant: ASTM C 920, Grade NS, Class 25, Uses NT, I, M, A, G, O; multi component, chemical curing, non-staining, non bleeding, capable of continuous water immersion, non-sagging type.
 - 1. Color: Standard colors matching finished surfaces.
 - 2. Application use for:
 - a. Exterior joints at walls, windows, doors, vents, flashing, etc.
 - b. Control, expansion, and soft joints in masonry.
 - c. Joints between concrete and other materials.
 - d. Joints between metal frames and other materials.
 - e. Other exterior joints for which no other sealant is indicated.
- H. Sanitary Silicone Sealant: ASTM C 920, Grade NS, Class 25, Uses NT, A, G, M, O; single component, solvent curing, non-sagging, non-staining, fungus resistant, non-bleeding.
 - 1. Color: Standard colors matching finished surfaces.
 - 2. Applications use for:
 - a. Interior joints at countertops, plumbing fixtures, ceramic tile, etc.

2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Plastic Foam Joint-Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of flexible, non-gassing, closed-cell polyethylene foam, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Provide type as recommended by sealant manufacturer.
- D. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
- E. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

- B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous and glazed joint surfaces as recommended by sealant manufacturer. Prime or seal joint surface where indicated, and where recommended by sealant manufacturer. Do not allow primer/sealer to migrate onto adjoining surfaces. Mask joints as necessary to protect adjacent surfaces. Remove masking immediately after sealing joint.
- E. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Set joint filler units at proper depth or position in joint to coordinate with other work, including installation of bond breakers, backer rods and sealant. Do not leave voids or gaps between ends of joint filler units. All caulked joints must be tape masked and tooled to be clean, smooth, even in width, and water tight.
- D. Employ only proven installation techniques, which will ensure that sealant are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt. Do not thin caulking compound. Apply in accordance with the manufacturer's recommendations.
- E. Install sealant to depths as shown or, if not shown, as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of bead. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to depth equal to 50 percent of joint width, but neither more than 1/2" deep nor less than 1/4" deep. For joints with non-elastomeric sealants and caulking compounds, fill joints to a depth in range of 75 percent to 125 percent of joint width. Joints to be tooled to slightly concave surface. Remove excess sealant material from adjacent surfaces. All adjacent painting must be completed before installing silicone caulking.
- F. Install bond breaker where joint backing is not used.
- G. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- H. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- I. Tool joints concave.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

3.05 PROTECTION

- A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal strength and surface durability. Advise Contractor of procedures required for cure and protection of joint sealers during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion.

END OF SECTION 07 9005

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Fire-rated hollow metal doors and frames.
- C. Thermally insulated hollow metal doors with frames.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware.
- B. Division 26 - Electrical: Electrical connections and/or devices to door hardware.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
- C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
- D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- I. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.
- K. ITS (DIR) - Directory of Listed Products; current edition.
- L. NAAMM HMMA 805 - Recommended Selection and Usage Guide for Hollow Metal Doors and Frames; 2012.
- M. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- N. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
- O. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.
- P. NAAMM HMMA 850 - Fire-Protection and Smoke Control Rated Hollow Metal Door and Frame Products; 2014.
- Q. NAAMM HMMA 860 - Guide Specifications for Hollow Metal Doors and Frames; 2013.
- R. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2006.
- S. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.
- T. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2016.
- U. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.

- V. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.
- W. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
- X. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- Y. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: www.steeldoor.org/sdicertified.php/#sle.
- B. Maintain at project site copies of reference standards relating to installation of products specified.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Doors and Frames:
 1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 3. Mesker, dormakaba Group: www.meskeropeningsgroup.com/#sle.
 4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
 5. Steelcraft, an Allegion brand: www.allegion.com/#sle.

2.02 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
 1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
 4. Door Edge Profile: Hinged edge square, and lock edge beveled.
 5. Typical Door Face Sheets: Flush.
 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
 - a. Based on NAAMM HMMA Custom Guidelines: Provide at least A25/ZF75 (galvannealed) for interior applications, and at least A60/ZF180 (galvannealed) or G60/Z180 (galvanized) for corrosive locations.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Exterior Doors: Thermally insulated.
 1. Based on NAAMM HMMA Custom Guidelines:
 - a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
 - b. Performance Level 2 - Moderate Duty, in accordance with NAAMM HMMA 805.
 - c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: G90/Z275 galvanized coating; ASTM A653/A653M.
 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 - a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.
 3. Door Thickness: 1-3/4 inch, nominal.
- C. Interior Doors, Non-Fire-Rated:
 1. Based on NAAMM HMMA Custom Guidelines:
 - a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
 - b. Performance Level 2 - Moderate Duty, in accordance with NAAMM HMMA 805.
 - c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 3. Door Thickness: 1-3/4 inch, nominal.
- D. Fire-Rated Doors:
 1. Based on NAAMM HMMA Custom Guidelines: Comply with NAAMM HMMA 850 requirements for fire-rated doors.
 - a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
 - b. Performance Level 2 - Moderate Duty, in accordance with NAAMM HMMA 805.
 - c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 3. Temperature-Rise Rating (TRR) Across Door Thickness: In accordance with local building code and authorities having jurisdiction.
 4. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - a. Attach fire rating label to each fire rated unit.
 5. Smoke and Draft Control Doors: Self-closing or automatic closing doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;

- a. Maximum Air Leakage: 3.0 cfm/sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
- b. Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.
- c. Label: Include the "S" label on fire-rating label of door.
- 6. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
- 7. Door Thickness: 1-3/4 inch, nominal.

2.04 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Exterior Door Frames: Full profile/continuously welded type.
 - 1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
 - 2. Frame Metal Thickness: 18 gage, 0.042 inch, minimum.
 - 3. Frame Finish: Factory primed and field finished.
 - 4. Weatherstripping: Separate, see Section 08 7100.
- C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
- D. Door Frames, Fire-Rated: Knock-down type.
 - 1. Fire Rating: Same as door, labeled.

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.
 - 1. Fire-Rated Frames: Comply with fire rating requirements indicated.

2.06 ACCESSORIES

- A. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
- B. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
- C. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Install door hardware as specified in Section 08 7100.
- F. Coordinate installation of electrical connections to electrical hardware items.

3.04 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 08 1113

SECTION 08 1213
HOLLOW METAL FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal frames for non-hollow metal doors.
- B. Fire-rated hollow metal frames for non-hollow metal doors.
- C. Interior glazed borrowed lite frames.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware: Hardware, silencers, and weatherstripping.
- B. Section 08 8000 - Glazing: Glazed borrowed lites.
- C. Division 26 - Electrical: Electrical connections and/or devices to door hardware.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
- C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2003 (R2009).
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2015.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2014.
- I. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2009.
- K. ITS (DIR) - Directory of Listed Products; current edition.
- L. NAAMM HMMA 805 - Recommended Selection and Usage Guide for Hollow Metal Doors and Frames; 2012.
- M. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- N. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
- O. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.
- P. NAAMM HMMA 850 - Fire-Protection and Smoke Control Rated Hollow Metal Door and Frame Products; 2014.
- Q. NAAMM HMMA 860 - Guide Specifications for Hollow Metal Doors and Frames; 2013.
- R. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2006.
- S. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.
- T. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2016.

- U. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2012.
- V. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.
- W. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.
- X. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- Y. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
- D. Samples: Submit one sample of frame metal, 2 inch by 2 inch, showing factory finishes, colors, and surface textures.
- E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
- F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store in accordance with applicable requirements and in compliance with standards and/or custom guidelines as indicated.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Frames with Integral Casings:
 1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 3. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
 4. Steelcraft, an Allegion brand: www.allegion.com/#sle.
 5. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- B. Hollow Metal Frames with Applied Casings, Prefinished:
 1. Timely Industries, Inc: www.timelyframes.com/#sle.
 2. The Dunbarton Group: RediFrame; www.dunbarton.com..
 3. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 PERFORMANCE REQUIREMENTS

- A. Door Frame Type: Provide hollow metal door frames with both integral casings and applied casings, in separate locations as indicated.
 1. See drawings for locations of each type of frame.
- B. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.

- C. Accessibility: Comply with ICC A117.1 and ADA Standards.
- D. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
- E. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior frame that is also indicated as being sound-rated must comply with the requirements specified for exterior frames and for sound-rated frames; where two requirements conflict, comply with the most stringent.
- F. Hardware Preparations, Selections and Locations: Comply with BHMA A156.115, NAAMM HMMA 830, NAAMM HMMA 831 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- G. Zinc Coating for Units Subject to Corrosive Conditions: Components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise.
- H. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
- I. Transom Bars: Fixed, of profile same as jamb and head.
- J. Frames for Interior Glazing or Borrowed Lites: Construction and face dimensions to match door frames, and as indicated on drawings.
- K. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch high to fill opening without cutting masonry units.
- L. Frames Wider than 48 Inch: Reinforce with steel channel fitted tightly into head of frame, flush with top.

2.03 HOLLOW METAL DOOR FRAMES WITH INTEGRAL CASINGS

- A. Exterior Door Frames: Full profile/continuously welded type.
 - 1. Based on NAAMM HMMA Custom Guidelines:
 - a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
 - b. Performance Level 1 - Light Duty, in accordance with NAAMM HMMA 805.
 - c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - d. Frame Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: Manufacturer's standard coating thickness; ASTM A653/A653M.
 - 2. Frame Finish: Factory primed and field finished.
 - 3. Weatherstripping: Refer to Section 08 7100.
- B. Interior Door Frames, Non-Fire Rated: Knock-down type.
 - 1. Based on NAAMM HMMA Custom Guidelines:
 - a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
 - b. Performance Level 1 - Light Duty, in accordance with NAAMM HMMA 805.
 - c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - d. Frame Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: Manufacturer's standard coating thickness; ASTM A653/A653M.
 - 2. Frame Finish: Factory primed and field finished.
- C. Fire-Rated Door Frames: Knock-down type.
 - 1. Based on NAAMM HMMA Custom Guidelines: Comply with NAAMM HMMA 850 requirements for fire-rated frames.
 - a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
 - b. Performance Level 1 - Light Duty, in accordance with NAAMM HMMA 805.
 - c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - d. Frame Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: Manufacturer's standard coating thickness; ASTM A653/A653M.

2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C or NFPA 252 ("positive pressure fire tests").
 3. Provide units listed and labeled by ITS (DIR) or UL (DIR).
 - a. Attach fire rating label to each fire rated unit.
 4. Smoke and Draft Control Doors: Self-closing or automatic closing framed doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;
 - a. Maximum Air Leakage: 3.0 cfm/sq ft of framed door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
 - b. Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.
 - c. Label: Include the "S" label on fire-rating label of door.
 5. Frame Finish: Factory primed and field finished.
- D. Fire-Rated Door Frames: Full profile/continuously welded type.
1. Based on NAAMM HMMA Custom Guidelines: Comply with NAAMM HMMA 850 requirements for fire-rated frames.
 - a. Comply with guidelines of NAAMM HMMA 860 for Hollow Metal Doors and Frames.
 - b. Performance Level 1 - Light Duty, in accordance with NAAMM HMMA 805.
 - c. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
 - d. Frame Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: Manufacturer's standard coating thickness; ASTM A653/A653M.
 2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C or NFPA 252 ("positive pressure fire tests").
 3. Provide units listed and labeled by ITS (DIR) or UL (DIR).
 - a. Attach fire rating label to each fire rated unit.
 4. Smoke and Draft Control Doors: Self-closing or automatic closing framed doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;
 - a. Maximum Air Leakage: 3.0 cfm/sq ft of framed door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
 - b. Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.
 - c. Label: Include the "S" label on fire-rating label of door.
 5. Frame Finish: Factory primed and field finished.

2.04 HOLLOW METAL DOOR FRAMES WITH APPLIED CASINGS

- A. Frame Type: Knockdown, slip-on drywall frames; separate jambs and head with separate snap-on casings both sides; factory-applied finish on exposed surfaces.
 1. Frame Material: Cold-rolled steel complying with ASTM A1008/A1008M.
 2. Casing Material: Formed steel.
 3. Casing Profile: Square corner.
 4. Finish: Factory-applied baked enamel finish, or electrostatically applied water-based paint.
 - a. Color: As selected from manufacturer's standard (non-premium) line.
- B. Interior Door Frames, Fire-Rated: Provide smoke gaskets.
 1. Frame Metal Thickness: 18 gage, 0.042 inch, minimum. Provide kirfed frame for smoke gaskets.
 2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C or NFPA 252 ("positive pressure fire tests").
 - a. Provide units listed and labeled by testing agency acceptable to authorities having jurisdiction, ITS (DIR), or UL (DIR).
 - b. Attach fire rating label to each fire rated unit.

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

- B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.
 - 1. Fire-Rated Frames: Comply with fire rating requirements indicated.

2.06 ACCESSORIES

- A. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- B. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
- C. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install frames in accordance with manufacturer's instructions and related requirements of specified frame standards or custom guidelines indicated.
- B. Install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Comply with glazing installation requirements of Section 08 8000.
- F. Install door hardware as specified in Section 08 7100.
 - 1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

3.04 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.05 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 08 1213

SECTION 08 1416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flush wood doors; flush and flush glazed configuration; fire-rated and non-rated.

1.02 RELATED REQUIREMENTS

- A. Section 01 2300 - Alternates.
- B. Section 06 2000 - Finish Carpentry: Wood door frames.
- C. Section 08 1213 - Hollow Metal Frames.
- D. Section 08 7100 - Door Hardware.
- E. Section 08 8050 - Glazing.

1.03 REFERENCE STANDARDS

- A. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.
- B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
- C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.
- D. California Air Resource Board.
- E. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.
- F. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2016.
- G. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- H. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2013.

1.04 ALTERNATES

- A. See Section 01 2300 - Alternates for Alternates affecting this section.
- B. **Alternate 1:** Provide and install pre-hung wood doors and frames in lieu of drywall frames and site-installed wood doors at interior dwelling unit doors. Wood casing shall be 1x3 paint-grade Poplar with radius at exposed corners.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- D. Samples: Submit two samples of door veneer, 8 by 10 inches in size illustrating wood grain, stain color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special installation instructions.
- F. Specimen warranty.
- G. Warranty, executed in Owner's name.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.

- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hardboard Faced Doors:
 - 1. Lynden Door: www.lyndendoor.com.
 - 2. Masonite: www.masonite.com.
 - 3. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 DOORS

- A. Doors: Refer to drawings for locations and additional requirements.
 - 1. Quality Standard: Custom Grade, Standard Duty performance, in accordance with AWI/AWMAC/WI (AWS), AWMAC/WI (NAAWS) or WDMA I.S. 1A.
 - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1 3/4 or 1 3/8 inches thick as indicated; flush construction.
 - 1. Provide solid core doors at each location, except provide hollow core doors at interior unit doors.
 - a. Provide solid core doors at barn doors.
 - b. Provide solid core doors at pocket doors.
 - 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
 - 3. Smoke and Draft Control Doors: In addition to required fire rating, provide flush wood door assemblies in compliance with WDMA I.S. 1A requirements for "S" label; no additional gasketing or edge sealing allowed.
 - 4. Doors inside dwelling units:
 - a. Lynden Door SD10NAUF hollow core flush panel.
 - 1) Where solid core door is required: Lynden Door IC350 SCLC.
 - b. Door faces: Hardboard.
 - c. Texture: Smooth.
 - d. Finish: Factory finished.
 - 1) Color: To be selected by Architect from manufacturer's complete range of standard colors.
 - 5. Hardboard facing with factory opaque finish as indicated elsewhere in these specifications.

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.
- B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.04 DOOR FACINGS

- A. Hardboard Facing for Opaque Finish: ANSI A135.4, Class 1 - Tempered, S2S (smooth two sides) hardboard, 1/8 inch thick.
 - 1. Doors shall have no added urea formaldehyde during fabrication of the hardboard material and manufacturing of the doors.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
 - 1. Provide solid blocks at lock edge for hardware reinforcement.
 - 2. Provide solid blocking for other throughbolted hardware.
- C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
 - 1. Exception: Doors to be field finished.
- F. Provide edge clearances in accordance with the quality standard specified.

2.06 WOOD FRAMES FOR PREHUNG DOORS

- A. **Alternate:** Prehung Swinging Doors: Provide prehung doors with wood frame complete with hinges.
 - 1. Interior Jamb, Head, and Casing: Milled solid or finger-jointed Ponderosa Pine, Idaho White Pine, Southern Pine, Douglas Fir, or equivalent WWPA species with factory-primed surfaces.
 - a. Jamb and Head: Not less than 1 1/16 inch (17 mm) thick for wall thickness indicated on drawings.
 - b. Casing: See Section 06 2000 - Finish Carpentry.
 - c. Finish: Painted; match color and sheen of door finish.
 - 2. Hinges for Prehung Doors: as specified in Section 08 7100 - Door Hardware.

2.07 POCKET DOORS:

- A. Prefabricated door frame units including framing in wall cavity and hardware for tracks, rollers and other components to complete installation of fully functional pocket doors.
 - 1. Henry Pocket Frames: www.henrypocketframes.com.
 - 2. Substitutions: See Sections 01 2513 - Product and Substitution Procedures.
- B. Site assembled frame and pocket door hardware kits:
 - 1. Stanley Security Solutions: PDF150N: www.stanleydoorhinges.com.
 - 2. Johnson Hardware: 1500 Series Pocket Door Frame: www.johnsonhardware.com.
 - 3. Kit and additional separate components shall consist of head track, hanger, door guide, bumper stop, base plate, end bracket, split stud uprights, pull, jamb stiffeners and adjusting wrench.
 - 4. Door pull: Privacy type with satin chrome or brushed stainless steel finish.
 - 5. Substitutions: See Sections 01 2513 - Product and Substitution Procedures.
- C. See Section 08 7100 - Door Hardware for pocket door hardware.
- D. Doors as specified above and sizes indicated on drawings.

2.08 BARN DOOR HARDWARE:

- A. K.N. Crowder; Product C-944 Hanger: www.kncrowder.com.
 - 1. Include the following required and optional components: C-108 side-mount track, CDC-911 door catch/stop and C-110 fascia and end cap.
- B. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.09 ACCESSORIES

- A. Hollow Metal Door Frames: As specified in Section 08 1213.
- B. Glazing: As specified in Section 08 8000.

- C. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 - 1. Install fire-rated doors in accordance with NFPA 80 requirements.
 - 2. Install smoke and draft control doors in accordance with NFPA 105 requirements.
 - 3. Provide undercut for ventilation at doors to laundry rooms or closets.
- B. Use machine tools to cut or drill for hardware.
- C. Coordinate installation of doors with installation of frames and hardware.
- D. Coordinate installation of glazing.

3.03 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

END OF SECTION 08 1416

SECTION 08 3113
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Access door and frame units, fire-rated and non-fire-rated, in wall and floor locations.

1.02 RELATED SECTIONS

- A. Section 09 2116 - Gypsum Board Assemblies: Openings in partitions.
- B. Section 09 9000 - Painting and Coating: Field paint finish.

1.03 REFERENCES

- A. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- B. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for submittal requirements and procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code for fire rated access doors.
 - 1. Provide access doors of fire rating equivalent to the fire rated assembly in which they are to be installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Access Doors:
 - 1. Acudor Products: www.acudor.com.
 - 2. J.L. Industries, Inc.: www.jlindustries.com.
 - 3. Milcor Inc: www.milcorinc.com.
 - 4. Nystrom, Inc.: www.nystrom.com

2.02 ACCESS DOOR UNITS - WALLS AND CEILINGS

- A. Door and Frame Units: Formed steel.
 - 1. Frames and flanges: 0.058 inch steel.
 - 2. Door panels: 0.070 inch single thickness steel sheet.
 - 3. Size: As indicated on drawings.
 - 4. Hardware:
 - a. Hinge: Concealed constant force closure spring type.
 - b. Lock: Quarter turn cylinder lock.
 - 5. Galvanized, hot dipped finish.
 - 6. Prime coat with alkyd primer.
- B. Fire Rated Door and Frame Units in Walls:
 - 1. In Gypsum Board:
 - a. One hour fire rating.
 - b. Model DW manufactured by Milcor, Inc; www.milcorinc.com.
- C. Fire Rated Door and Frame Units in Ceilings:
 - 1. In Gypsum Board on Metal Furring:
 - a. 1 hour fire rating.
 - b. Model DW manufactured by Milcor, Inc.; www.milcorinc.com.

2.03 FABRICATION

- A. Weld, fill, and grind joints to ensure flush and square unit.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings for door and frame are correctly sized and located.

3.02 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings. Secure rigidly in place.
- C. Position units to provide convenient access to the concealed work requiring access.

END OF SECTION 08 3113

SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
 - 1. Infill panels of metal and glass.
- B. Aluminum doors and frames.
- C. Weatherstripping, sweeps and thresholds.
- D. Perimeter sealant.

1.02 RELATED SECTIONS

- A. Section 07 9005 - Joint Sealers: Perimeter sealant and back-up materials.
- B. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.
- C. Section 08 8050 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.
- B. AAMA 501.2 - Field Check of Metal Storefronts, Curtain Walls, and Sloped Glazing Systems for Water Leakage; 2009.
- C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- D. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010, with 2013 Supplements and Errata.
- F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- J. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- K. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- L. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).

1.04 PERFORMANCE REQUIREMENTS

- A. Design and size components to withstand the following load requirements without damage or permanent set, when tested in accordance with ASTM E 330, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - 1. Design Wind Loads: Comply with requirements of ASCE 7.
- B. Movement: Accommodate movement between storefront and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
- C. Thermal Transmittance of Vision Areas:
 - 1. Glass Front Set: $U = 0.47$ (low-e); $U = 0.61$ (clear).

- D. Air Infiltration: Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E 283.
- E. Condensation Resistance Factor when measured in accordance with AAMA 1503.1:
 - 1. Glass Exterior Set: Frame and low-e glass, 70 and 69 respectively; frame and clear glass, 69 and 58 respectively.
- F. Water Leakage: None, when measured in accordance with ASTM E 331 with a test pressure difference of 2.86 lbf/sq ft.
- G. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
- H. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and inner sheet of infill panel and heel bead of glazing compound.
- I. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for submittal requirements and procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, internal drainage details .
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
- D. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- E. Samples: Submit two samples 2 x 2 inches in size illustrating finished aluminum surface materials.
- F. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.08 WARRANTY

- A. See Section 01 7700 - Closeout Procedures for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Kawneer Company, Inc.; www.kawneer.com.
 - 1. Storefront system: "Trifab 451T".
 - 2. Entrance system: "500 Wide Stile".
- B. Other acceptable aluminum-framed storefront and door manufacturers:
 - 1. EFCO; www.efcocorp.com.
 - 2. CMI Architectural Products; www.cmiarch.com.
 - 3. Oldcastle Glass Vistawall Architectural Product: www.vistawall.com.
 - 4. Tubelite, Inc: www.tubeliteinc.com/#sle.
 - 5. YKK AP America Inc: www.ykkap.com/#sle.
 - 6. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, thermally broken, mechanically retained glazing system, and related flashings, anchorage and attachment devices.
 - 1. Glazing Rabbet: For 1 inch insulating glazing.
 - 2. Glazing Rabbet: For 1/4 inch monolithic glazing.
 - 3. Glazing Position: Front-set.
 - 4. Vertical and horizontal mullion dimensions: 2 inches wide by 4-1/2 inches deep.
 - a. Bottom rail at pavement dimensions: 4 inches nominal wide by 4-1/2 inches deep.
 - 5. Air Infiltration: For single acting offset pivot or butt hung entrances in the closed and locked position, the test specimen shall be tested in accordance with ASTM E 283 at a pressure differential of 6.24 psf for single doors and 1.567 psf for pairs of doors. A single 3'0" x 7'0" entrance door and frame shall not exceed 0.50 cfm per square foot. A pair of 6'0" x 7'0" entrance doors and frame shall not exceed 1.0 cfm per square foot.
 - 6. Overall U-Value Including Glazing: 0.35, maximum.
 - 7. Finish: Pigmented organic coatings.
 - a. Factory finish all surfaces that will be exposed in completed assemblies.
 - b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
 - c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
 - 8. Finish Color: As selected by Architect from manufacturer's standard line.
 - 9. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 - 10. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
 - 11. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 - 12. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 - 13. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
 - 14. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 - 15. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.

- B. Performance Requirements:
 - 1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Design Wind Loads: Comply with requirements of ASCE 7.
 - b. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
 - 2. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf.
 - 3. Air Leakage: Maximum of 0.06 cu ft/min sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 psf pressure differential across assembly.
 - 4. Condensation Resistance Factor of Framing: 70, minimum, measured in accordance with AAMA 1503.

2.03 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.
 - 1. Basis of Design: Kawneer "Trifab 451T".
 - 2. Framing members for interior applications need not be thermally broken.
 - 3. Glazing stops: Flush.
 - 4. Cross-Section: 1/8 x 4-1/2 x 2 inch nominal dimension.
- B. Glazing: As specified in Section 08 8000.
- C. Infill Metal Panels: Insulated, aluminum sheet face and back, with edges formed to fit glazing channel and sealed.
 - 1. Face Sheet: 0.021 inch thick.
 - 2. Core: Rigid polystyrene insulation core with R value of 5.
 - 3. Back Sheet: 0.021 inch thick.
 - 4. Finish: Same as storefront.
- D. Doors: Glazed aluminum, full lite.
 - 1. Basis of Design: Kawneer "500 Wide Stile".
 - 2. Thickness: 1-3/4 inches.
 - 3. Top Rail: 5 inches wide.
 - 4. Vertical Stiles: 5 inches wide.
 - 5. Bottom Rail: 10 inches wide.
 - 6. Intermediate Rails: 5 inches wide.
 - 7. Glazing Stops: Square.
 - 8. Finish: Same as storefront.

2.04 MATERIALS

- A. Extruded Aluminum: ASTM B 221 (ASTM B 221M), minimum of 1/8" thickness.
- B. Sheet Aluminum: ASTM B209 (ASTM B209M).
- C. Fasteners: Stainless steel.
- D. Perimeter Sealant: Two-part non-sag polyurethane specified in Section 07 9005 - Joint Sealers.
- E. Glass: As specified in Section 08 8050.
- F. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.05 FINISHES

- A. High Performance Organic Coatings: AAMA 2604; multiple coats, thermally cured fluoropolymer system.
- B. Color: As indicated above.
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.06 HARDWARE

- A. Door Hardware: Manufacturer's standard. Coordinate operation with entry access control system.
- B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- D. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.
- E. Push/Pull Set: Manufacturer's standard tubular style.
 - 1. Provide on all doors, unless noted otherwise.

2.07 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
- E. Arrange fasteners and attachments to conceal from view.
- F. Reinforce components internally for door hardware .
- G. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.
 - 1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- I. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- J. Set thresholds in bed of mastic and secure.
- K. Install glass and infill panels in accordance with Section 08 8050, using glazing method required to achieve performance criteria.
- L. Install perimeter sealant in accordance with Section .

- M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 FIELD QUALITY CONTROL

- A. See Section 01 4500 - Quality Control requirements for independent testing and inspection requirements. Inspection will monitor quality of installation and glazing.
- B. Test installed storefront for water leakage in accordance with AAMA 501.2.

3.05 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.06 CLEANING

- A. Remove protective material from prefinished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

END OF SECTION 08 4313

SECTION 08 5113
ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Extruded aluminum windows with fixed sash, operating sash, and infill panels.
- B. Factory glazing.
- C. Operating hardware.
- D. Insect screens.

1.02 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealing joints between window frames and adjacent construction.
- B. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2017.
- B. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.
- C. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products; 2012.
- D. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
- E. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- F. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- G. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- I. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- J. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2014.
- K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- L. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- M. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- N. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- O. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2010).
- P. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.

- Q. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2014.
- R. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2007 (Reapproved 2016).
- S. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact; 2017.
- T. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.
- C. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, method for achieving air and vapor barrier seal to adjacent construction, anchorage locations, _____, and installation requirements.
- D. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
 - 1. Evidence of AAMA Certification.
 - 2. Evidence of WDMA Certification.
 - 3. Evidence of CSA Certification.
 - 4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.
- E. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.
- F. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.
- G. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- H. Installer's Qualification Statement.
- I. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of AAMA CW-10.
- B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F.
- B. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Graham Architectural Products; Series SR6700: www.grahamwindows.com.
- B. Other Acceptable - Aluminum Windows Manufacturers:
 - 1. TRACO: www.traco.com/#sle.
 - 2. Wausau Window and Wall Systems; _____: www.wausauwindow.com/#sle.
 - 3. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 WINDOWS

- A. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.
 - 1. Operable Units: Double weatherstripped.
 - 2. Provide units factory glazed.
 - 3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.
 - 4. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 - 5. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
 - 6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 - 7. Thermal Movement: Design to accommodate thermal movement caused by 180 degrees F surface temperature without buckling stress on glass, joint seal failure, damaging loads on structural elements, damaging loads on fasteners, reduction in performance or other detrimental effects.
- B. Fixed, Non-Operable Type:
 - 1. Construction: Thermally broken.
 - 2. Glazing: Double; clear; low-e.
 - 3. Exterior Finish: Superior performing organic coatings.
 - 4. Interior Finish: High performance organic coatings.
- C. Outswinging Casement Type:
 - 1. Construction: Thermally broken.
 - 2. Provide screens.
 - 3. Glazing: Double; clear; low-e.
 - 4. Exterior Finish: Superior performing organic coatings.
 - 5. Interior Finish: High performance organic coatings.

2.03 PERFORMANCE REQUIREMENTS

- A. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
 - 1. Performance Class (PC): CW.
 - 2. Performance Grade (PG): Equivalent to or greater than specified design pressure.
- B. Design Pressure (DP): In accordance with applicable codes.

- C. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
- D. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, tested by independent agency in accordance with ASTM E1996 for Wind Zone 2 - Enhanced Protection for Large and Small Missile impact and pressure cycling at design wind pressure.
- E. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 12.11 psf.
- F. Air Leakage: Maximum of 0.1 cu ft/min sq ft per unit area of outside frame dimension, with 6.27 psf differential pressure when tested in accordance with ASTM E283.
- G. Condensation Resistance Factor of Frame: 50, measured in accordance with AAMA 1503.
- H. Fenestration Assembly Thermal Transmittance (U-value): Comply with ASHRAE Std 90.1 I-P for building envelope requirements for applicable climate zone.
- I. Forced Entry Resistance: Tested to comply with ASTM F588 requirements for performance level of Grade 10 for specific window style required.

2.04 COMPONENTS

- A. Frames: ____ inch wide by ____ inch deep profile, of ____ inch thick section; thermally broken with interior portion of frame insulated from exterior portion; flush glass stops of snap-on type.
- B. Glazing: As specified in Section 08 8050.
- C. Sills: ____ inch thick, extruded aluminum; sloped for positive wash; fit under sash leg to 1/2 inch beyond wall face; one piece full width of opening; jamb angles to terminate sill end.
- D. Insulated Infill Panel:
 - 1. Outer Face: 1/16 inch thick aluminum.
 - 2. Core: Glass fiber insulation core 7/8 inch thick with R-value of 4.4.
 - 3. Inner Face: 1/16 inch thick aluminum.
- E. Insect Screens: Extruded aluminum frame with mitered and reinforced corners; screen mesh taut and secure to frame; secured to window with adjustable hardware allowing screen removal without use of tools.
 - 1. Hardware: Spring loaded steel pins; four per screen unit.
 - 2. Screen Mesh: Vinyl-coated fiberglass, window manufacturer's standard mesh.
 - 3. Frame Finish: Same as frame and sash.
- F. Operable Sash Weatherstripping: Wool pile; permanently resilient, profiled to achieve effective weather seal.
- G. Fasteners: Stainless steel.
- H. Glazing Materials: As specified in Section 08 8000.
- I. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.
 - 1. Refer to Section 07 9200 for additional requirements.

2.05 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- B. Sheet Aluminum: ASTM B209 (ASTM B209M), 5005 alloy, H12 or H14 temper.
- C. Concealed Steel Items: Profiled to suit mullion sections; galvanized in accordance with ASTM A123/A123M.

2.06 HARDWARE

- A. Sash lock: Lever handle with cam lock.
- B. Operator: Geared rotary handle fitted to projecting sash arms with limit stops.
- C. Projecting Sash Arms: Cadmium plated steel, friction pivot joints with nylon bearings, removable pivot clips for cleaning.

- D. Window Opening Control Devices (WOCD): Provide operable window sash hardware that limits openings to only allow passage of 4 inch diameter rigid sphere or less, and are easily releasable to fully open without use of keys, tools, or special knowledge.
- E. Pulls: Manufacturer's standard type.
- F. Limit Stops: Resilient rubber.

2.07 FINISHES

- A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
 - 1. Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 0.9 mil; color and gloss as indicated on drawings.
 - a. Manufacturers:
 - 1) PPG Metal Coatings; Duranar: www.ppgmetalcoatings.com/#sle.
 - 2) Sherwin-Williams Company; SHER-NAR 5000: oem.sherwin-williams.com/#sle.
 - 3) Valspar; Fluropon: www.valsparcoilextrusion.com/#sle.
- B. Finish Color: As selected by Architect from manufacturer's standard range.
- C. Operator and Exposed Hardware: Enameled to color as selected from manufacturer's standard line.
- D. Apply one coat of bituminous coating to concealed aluminum and steel surfaces in contact with dissimilar materials.
- E. Shop and Touch-Up Primer for Steel Components: Zinc oxide, alkyd, linseed oil primer appropriate for use over hand cleaned steel.
- F. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that wall openings and adjoining air and vapor seal materials are ready to receive aluminum windows.

3.02 INSTALLATION

- A. Install windows in accordance with manufacturer's instructions.
- B. Install window assembly in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
- C. Install windows in accordance with ASTM E2112.
- D. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- E. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- F. Install sill and sill end angles.
- G. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- H. Install operating hardware not pre-installed by manufacturer.
- I. Install glass and infill panels in accordance with requirements specified in Section 08 8000.

3.03 TOLERANCES

- A. Maximum Variation from Level or Plumb: 1/16 inches every 3 ft non-cumulative or 1/8 inches per 10 ft, whichever is less.

3.04 FIELD QUALITY CONTROL

- A. Provide services of aluminum window manufacturer's field representative to observe for proper installation of system and submit report.
- B. See Section 01 4000 - Quality Requirements, for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- C. Provide field testing of installed aluminum windows by AAMA accredited independent laboratory in accordance with AAMA 502 and AAMA/WDMA/CSA 101/I.S.2/A440 during construction process and before installation of interior finishes.
 - 1. Perform tests on windows in designated locations as directed by Architect. Quantity and time of test as follows:
 - a. Conduct tests 1.67% of total number of windows in project at 35 percent completion of this work;
 - b. Conduct tests 1.67% of total number of windows in project at 50 percent completion of this work; and
 - c. Conduct tests 1.67% of total number of windows in project at 85 percent completion of this work.
 - 2. Field test for water penetration in accordance with ASTM E1105 using Procedure B - cyclic static air pressure difference; test pressure shall not be less than 1.9 psf.
 - 3. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 1.57 psf.
 - a. Maximum allowable rate of air leakage is 1.5 times specified rate of 0.10 cfm/sq ft as indicated in AAMA/WDMA/CSA 101/I.S.2/A440.
 - 4. If any window fails, immediately test five additional windows at Contractor's expense. Continue to test at Contractor's expense groups of five additional windows, if any window fails until all five windows of a subsequent test group pass testing.
- D. Repair or replace fenestration components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

- A. Adjust hardware for smooth operation and secure weathertight closure.

3.06 CLEANING

- A. Refer to Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- B. Remove protective material from factory finished aluminum surfaces.
- C. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
- D. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.
- E. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

END OF SECTION 08 5113

SECTION 08 5123
STEEL WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Factory finished steel windows with fixed and operating sash.
- B. Factory-installed glazing .
- C. Operating hardware and framed insect screens.

1.02 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- B. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2017.
- B. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products; 2012.
- C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- D. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
- G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- H. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
- I. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- J. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- K. ASTM E783 - Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors; 2002 (Reapproved 2010).
- L. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.
- M. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2007 (Reapproved 2016).
- N. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact; 2017.
- O. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- P. SWI (INTRO) - Architect's Guide to Steel Windows and Doors; Current Edition.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide component dimensions, fasteners, anchors, and glass.
- C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work; installation requirements.
- D. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements.
- E. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- F. Manufacturer's Qualification Statement.
- G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing windows specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect factory finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F.
- B. Maintain this minimum temperature during and after installation of sealants.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same.
 - 1. Include coverage for degradation of color finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steel Windows:
 - 1. Hope's Windows, Inc; Landmark 175 Series: www.hopeswindows.com/#sle.

2.02 STEEL WINDOWS

- A. Steel Windows: Hot rolled steel sections, factory fabricated, factory finished, with vision glass, related flashings, anchorage and attachment devices.
 - 1. Grade: Heavy Intermediate design based on SWI (INTRO).
 - 2. Sash Configuration: Fixed non-operable and casement lights.
 - 3. Forced Entry Resistance: Comply with ASTM F588 requirements for performance level of Grade 10 for window Type A in accordance with standard.

2.03 PERFORMANCE REQUIREMENTS

- A. Wind Loads: Design and size components to withstand wind loads without damage or permanent set, when tested in accordance with ASTM E330/E330M, using pressure equal to 1.5 times specified design pressures, with 10 second duration of maximum load.
- B. Design Pressure: In accordance with applicable codes.

- C. Member Deflection: Limit member deflection to 1/200 of the longer dimension; with full recovery of glazing materials.
- D. Air Infiltration: Limit air infiltration through assembly to 0.06 cfm/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E283.
- E. Condensation Resistance Factor: CRF of _____ when measured in accordance with AAMA 1503.
- F. Fenestration Assembly Thermal Transmittance (U-value): Comply with ASHRAE Std 90.1 I-P for building envelope requirements for applicable climate zone.
- G. Water Leakage: None, when measured in accordance with ASTM E331 with a test pressure difference of 2.86 lbf/sq ft.
- H. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system to the exterior by a weep drainage network.

2.04 COMPONENTS

- A. Frames: _____ inch by _____ inch deep profile; flush glass stops of snap-on type.
- B. Sills: _____ inch thick, formed steel; sloped for positive wash; fit under sash leg to 1/2 inch beyond wall face; one piece full width of opening with jamb angles to terminate sill end.
- C. Insect Screen Frame: Rolled steel frame of rectangular sections; fit with adjustable hardware; nominal size similar to operable glazed unit.
- D. Insect Screens: 14/18 mesh, steel strands.
- E. Operable Sash Weather Stripping: Wool pile; permanently resilient, profiled to effect weather seal.
- F. Sealant for Setting Sills, Stools, Aprons, and Sill Flashing: Non-curing butyl type.
 1. Refer to Section 07 9200 for additional requirements.

2.05 MATERIALS

- A. Hot Rolled Steel Sections: ASTM A36/A36M, galvanized to ASTM A123/A123M requirements; 3 lb/ft; with slot for fitting weather stripping integral with sash section.
- B. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating; 26 gage, 0.0179 inch thick base metal.
- C. Fasteners: Steel, galvanized.
- D. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20.

2.06 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials: As specified in Section 08 8000 of Types as indicated below:

2.07 HARDWARE

- A. Sash lock: Lever handle with cam lock.
- B. Operator: Lever action handle fitted to projecting sash arms with limit stops.
- C. Projecting Sash Arms: Cadmium plated steel, friction pivot joints with nylon bearings, removable pivot clips for cleaning.
- D. Window Opening Control Devices (WOCD): Provide operable window sash hardware that limits openings to only allow passage of 4 inch diameter rigid sphere or less, and are easily releasable to fully open without use of keys, tools, or special knowledge.

2.08 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush and hairline.

- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners to conceal from view.
- E. Prepare components with reinforcement for operating hardware.
- F. Reinforce mullions with internal galvanized steel members to maintain rigidity.
- G. Provide internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.
- H. Assemble insect screen frame, miter and reinforced frame corners. Fit mesh taut into frame and secure. Fit frame with four spring loaded steel pin retainers.
- I. Double weatherstrip operable units.
- J. Factory-glaze window units.

2.09 FINISHES

- A. Window Frames: Baked enamel finish.
 - 1. Exterior Surfaces: Color as selected from manufacturer's standard range.
 - 2. Interior Surfaces: Color as selected from manufacturer's standard range.
- B. Screens: Color as selected by Architect.
- C. Operator: Enameled with color as selected by Architect.
- D. Concealed Steel Items:
 - 1. Galvanized in accordance with requirements of ASTM A123/A123M.
- E. Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with treated wood, cementitious, or dissimilar materials.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install window frames and glass and glazing in accordance with manufacturers instructions.
- B. Install windows in accordance with ASTM E2112.
- C. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- D. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
- E. Install sill and sill end angles.
- F. Set sill members and sill flashing in continuous bead of sealant.
- G. Install operating hardware.
- H. Install glass and infill panels in accordance with Section 08 8000, to glazing method required to achieve performance criteria.

3.02 TOLERANCES

- A. Maximum Variation from Level or Plumb: 1/16 inches in 3 ft non-cumulative or 1/8 inches per 10 ft.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- B. Provide field testing of installed steel windows by independent laboratory in accordance with AAMA 502 and AAMA/WDMA/CSA 101/I.S.2/A440 during construction process and before installation of interior finishes.
 - 1. Conduct tests on individual windows prior to 5 percent and 50 percent completion of this work.
 - 2. Field test for water penetration in accordance with ASTM E1105 using Procedure B - cyclic static air pressure difference; test pressure shall not be less than 1.9 psf.

3. Field test for air leakage in accordance with ASTM E783 with uniform static air pressure difference of 6.27 psf.
- C. Repair or replace fenestration components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.04 ADJUSTING

- A. Adjust hardware for smooth operation and secure weathertight closure.

3.05 CLEANING

- A. Refer to Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- B. Remove protective material from factory finished surfaces.
- C. Remove labels and visible markings.
- D. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
- E. Remove excess glazing sealant by method acceptable to sealant manufacturer.

3.06 PROTECTION

- A. Do not permit continuing construction activities near unprotected finish surfaces.

END OF SECTION 08 5123

SECTION 08 6200
UNIT SKYLIGHTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Skylights with integral frame.

1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications: Miscellaneous steel framing for rough opening.
- B. Section 06 1000 - Rough Carpentry: Wood support curbs.
- C. Section 07 5300 - Elastomeric Membrane Roofing: Roofing system and base flashing at skylight curb.
- D. Section 07 6200 - Sheet Metal Flashing and Trim: Skylight counterflashing.

1.03 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2017.
- B. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
- C. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- E. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- F. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2007 (Reapproved 2016).
- G. ICC (IBC) - International Building Code; 2015.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide structural, thermal, and daylighting performance values.
- C. Shop Drawings: Indicate configurations, dimensions, locations, fastening methods, and installation details.
- D. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
 - 1. Evidence of AAMA Certification.
 - 2. Evidence of WDMA Certification.
 - 3. Evidence of CSA Certification.
 - 4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with not less than five years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years documented experience.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty, including coverage for leakage due to defective skylight materials or construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Unit Skylights:
 - 1. Kingspan Light + Air, LLC; formerly Bristolite Daylighting Systems, Inc; Bristol: www.bristolite.com/#sle.
 - 2. Velux America, Inc: www.veluxusa.com/#sle.
 - 3. Wasco Skylights - Part of the VELUX Group: www.wascoskylights.com/#sle.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 SKYLIGHTS

- A. Skylights: Factory-assembled glazing in aluminum frame, free of visual distortion, and weathertight.
 - 1. Shape: Square dome.
 - 2. Glazing: Double.
 - 3. Operation: None; fixed.
 - 4. Roof Slope: As indicated on drawings.
 - 5. Nominal Size: As indicated on drawings.

2.03 PERFORMANCE REQUIREMENTS

- A. Provide unit skylights that comply with the following:
 - 1. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific skylight type:
 - a. Performance Grade (PG): Equivalent to or greater than specified design pressure.
 - 2. Design Pressure (DP): In accordance with applicable codes.
 - 3. Allow for expansion and contraction within system components caused by a cycling surface temperature range of 170 degrees F without causing detrimental effects to system or components.
 - 4. Energy Code Compliance: Comply with ICC (IBC), ASHRAE Std 90.1 I-P, or the authorities having jurisdiction as required for unit skylights.

2.04 COMPONENTS

- A. Double Glazing: Acrylic plastic; factory sealed.
 - 1. Outer Glazing: Clear transparent.
 - 2. Inner Glazing: Clear transparent.
 - 3. Ultraviolet (UV) Light Transmission: 2 percent, maximum.
- B. Frames: ASTM B221 (ASTM B221M) Extruded aluminum thermally broken, reinforced and welded corner joints, integral curb frame mounting flange and counterflashing to receive roofing flashing system, with integral condensation collection gutter, glazing retainer; clear anodized finish.

2.05 ACCESSORIES

- A. Anchorage Devices: Type recommended by manufacturer, exposed to view.
- B. Counterflashings: Same metal type and finish as skylight frame.
- C. Protective Back Coating: Zinc molybdate alkyd.
- D. Sealant: Elastomeric, silicone or polyurethane, compatible with material being sealed .

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that openings and substrate conditions are ready to receive work of this section.

- C. Verify that curbs installed under other sections are complete.

3.02 PREPARATION

- A. Apply protective back coating on aluminum surfaces of skylight units that will be in contact with cementitious materials or dissimilar metals.

3.03 INSTALLATION

- A. Install unit skylights in accordance with manufacturer's instructions and ASTM E2112.
- B. Install aluminum curb assembly, fastening securely to roof decking; flash curb assembly into roofing system.
- C. Install skylight units and mount securely to curb assembly; install counterflashing as required.
- D. Apply sealant to achieve watertight assembly.

3.04 CLEANING

- A. Upon completion of installation, thoroughly clean skylight aluminum surfaces in accordance with AAMA 609 & 610.
- B. Remove protective material from prefinished aluminum surfaces.
- C. Wash down exposed surfaces; wipe surfaces clean.
- D. Remove excess sealant.

END OF SECTION 08 6200

**SECTION 08 71 00
DOOR HARDWARE**

PART 1 - GENERAL

1.1 CONDITIONS

- A. Conditions of the contract (General and Supplementary Conditions) and Division One General Requirements, govern the work of this section.
- B. This section includes all material, and related service necessary to furnish all finish hardware indicated on the drawings, or specified herein.
- C. Furnish UL listed hardware for all labeled and 20 min. openings in conformance with the requirements for the class of opening scheduled. Underwriters' requirements shall have precedence over specification where conflicts exist.
- D. All work shall be in accordance with all applicable state and local building codes. Code requirements shall have precedence over this specification where conflicts exist.

1.2 WORK INCLUDED

- A. This section includes the following:
 - 1. Furnish door hardware (for hollow metal, wood and aluminum doors) specified herein, listed in the hardware schedule, and/or required by the drawings.
 - 2. Cylinders for Aluminum Doors
 - 3. Thresholds and Weather-stripping (Aluminum frame seals to be provided by aluminum door supplier)
 - 4. Electro-Mechanical Devices
 - 5. Access Control components and or systems specified within this section.
- B. Where items of hardware are not definitely or correctly specified and is required for the intended service, such omission, error or other discrepancy should be directed to the Architect prior to the bid date for clarification by addendum. Otherwise furnish such items in the type and quantity established by this specification for the appropriate service intended.

1.3 RELATED WORK IN OTHER SECTIONS

- A. This section includes coordination with related work in the following sections:
 - 1. Division 6 Section "Finish Carpentry".
 - 2. Division 6 Section "Cabinet Hardware"
 - 3. Division 8 Section "Hollow Metal Doors and Frames".
 - 4. Division 8 Section "Wood Doors"
 - 5. Division 8 Section "Aluminum Entrances and Storefronts"
 - 6. Division 28 Sections "Electrical".

1.4 REFERENCES

- A. Publications of agencies and organizations listed below form a part of this specification section to the extent referenced.
 - 1. DHI - Recommended Locations for Builders' Hardware.
 - 2. NFPA 80 - Standards for Fire Doors and Windows.
 - 3. NFPA 101 - Code for Safety to Life from Fire in Buildings and Structures.
 - 4. UL - Building Material Directory.
 - 5. DHI - Door and Hardware Institute
 - 6. WHI - Warnock Hersey
 - 7. BHMA - Builders Hardware Manufacturers Association
 - 8. ANSI - American National Standards Institute
 - 9. IBC 2012 - International Building Code 2012 Edition (as amended by local building code)

1.5 SUBMITTALS

- A. Within ten days after award of contract, submit detailed hardware schedule in quantities as required by Division 1 - General Conditions.
- B. Schedule format shall be consistent with recommendations for a vertical format as set forth in the Door & Hardware Institute's (DHI) publication "Sequence and Format for the Hardware Schedule". Hardware sets shall be consolidated to group multiple door openings which share similar hardware requirements. Schedule shall include the following information:
 - 1. Door number, location, size, handing, and rating.
 - 2. Door and frame material, handing.
 - 3. Degree of swing.
 - 4. Manufacturer
 - 5. Product name and catalog number
 - 6. Function, type and style
 - 7. Size and finish of each item
 - 8. Mounting heights
 - 9. Explanation of abbreviations, symbols, etc.
 - 10. Numerical door index, indicating the hardware set/ group number for each door.
- C. When universal type door closers are to be provided, the schedule shall indicate the application method to be used for installation at each door: (regular arm, parallel arm, or top jamb).
- D. The schedule will be prepared under the direct supervision of a certified Architectural Hardware Consultant (AHC), or certified Door Hardware Consultant (DHC) employed by the hardware distributor. The hardware schedule shall be signed and embossed or stamped with the DHI certification seal of the supervising AHC or DHC. The supervising AHC or DHC shall attend any meetings related to the project when requested by the architect.
- E. Check the specified hardware for suitability and adaptability to the details and surrounding conditions.
- F. Review drawings from related trades as required to verify compatibility with specified hardware. Indicate unsuitable or incompatible items, and proposed substitutions in the hardware schedule.
- G. Provide documentation for all hardware to be furnished on labeled fire doors indicating compliance with positive pressure fire testing UL 10C.
- H. Furnish manufacturers' catalog data for each item of hardware in quantities as required by Division 1 - General Conditions.
- I. Submit a sample of each type of hardware requested by the architect. Samples shall be of the same finish, style, and function as specified herein. Tag each sample with its permanent location so that it may be used in the final work.
- J. Furnish with first submittal, a list of required lead times for all hardware items.
- K. After final approved schedule is returned, transmit corrected copies for distribution and field use in quantities as required by Division 1 - General Conditions.
- L. Furnish approved hardware schedules, template lists, and pertinent templates as requested by related trades.
- M. Furnish necessary diagrams, schematics, voltage and amperage requirements for all electro-mechanical devices or systems as required by related trades. Wiring diagrams shall be opening specific and include both a riser diagram and point to point diagram showing all wiring terminations.
- N. After receipt of approved hardware schedule, Hardware supplier shall initiate a meeting including the owner's representative to determine keying requirements. Upon completion of initial key meeting, hardware supplier shall prepare a proposed key schedule with symbols and abbreviations as set forth in the door and hardware institute's publication "Keying Procedures, Systems, and Nomenclature". Submit copies of owner approved key schedule for review and

field use in quantities as required by Division 1 – General Conditions. Wiring diagrams shall be included in final submittals transmitted for distribution of field use.

1.6 QUALITY ASSURANCE

- A. Manufacturers and model numbers listed are to establish a standard of function and quality. Similar items by approved manufacturers that are equal in design, function, and quality, may be considered for prior approval of the architect, provided the required data and physical samples are submitted for approval as set forth in Division One General Requirements.
- B. Where indicated in this specification, products shall be independently certified by ANSI for compliance with relevant ANSI/BHMA standards A156.1 - A156.36 – Standards for Hardware and Specialties. All products shall meet or exceed certification requirements for the respective grade indicated within this specification. Supplier shall provide evidence of certification when requested by the architect.
- C. Obtain each type of hardware (hinges, latch & locksets, exit devices, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.
- D. Electrical drawings and electrical specifications are based on the specific electrified hardware components specified in hardware sets. When electronic hardware components other than those indicated in hardware sets are provided, the supplier shall be responsible for all costs incurred by the design team and their consultants to review, and revise electrical drawings and electrical specifications. Supplier shall also be responsible for any additional costs associated with required changes in related equipment, materials, installation, or final hook up to ensure the system will operate and function as indicated in the construction documents, including hardware set operational / functional descriptions.
- E. All hardware items shall be manufactured no earlier than 6 months prior to delivery to site.
- F. Hardware supplier shall be factory trained and certified by the manufacturer to provide and support all computer managed locks and system components.
- G. Installation of hardware shall be installed or directly supervised and inspected by a skilled installer certified by the manufacturer of locksets, door closers, and exit devices used on the project, or with not less than 3 years' experience in successful completion of projects similar in size and scope.
- H. Provide hardware for all labeled fire doors, which complies with positive pressure fire testing UL 10C.
- I. Comply with all applicable provisions of the standards referenced within section 1.4 of this specification.
- J. Hardware supplier shall participate when reasonably requested to meet with the contractor and or architect to inspect any claim for incorrect or non-functioning materials; following such inspection, the hardware supplier shall provide a written statement documenting the cause and proposed remedy of any unresolved items.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Hardware supplier shall deliver hardware to the job site unless otherwise specified.
- B. All hardware shall be delivered in manufacturers' original cartons and shall be clearly marked with set and door number.
- C. Coordinate with contractor prior to hardware delivery and recommend secure storage and protection against loss and damage at job site.
- D. Contractor shall receive all hardware and provide secure and proper protection of all hardware items to avoid delays caused by lost or damaged hardware. Contractor shall report shortages to the Architect and hardware supplier immediately after receipt of material at the job site.

- E. Coordinate with related trades under the direction of the contractor for delivery of hardware items necessary for factory installation.

1.8 PRE-INSTALLATION MEETING

- A. Schedule a hardware pre-installation meeting on site to review and discuss the installation of continuous hinges, locksets, door closers, exit devices, overhead stops, and electromechanical door hardware.
- B. Meeting attendees shall be notified 7 days in advance and shall include: Architect, Contractor, Door Hardware Installers (including low voltage hardware), Manufacturers representatives for above hardware items, and any other effected subcontractors or suppliers.
- C. All attendees shall be prepared to distribute installation manuals, hardware schedules, templates, and physical hardware samples.

1.9 WARRANTY

- A. All hardware items shall be warranted against defects in material and workmanship as set forth in Division One General Requirements.
- B. Repair, replace, or otherwise correct deficient materials and workmanship without additional cost to owner.

PART 2 - PRODUCTS

2.1 FASTENERS

- A. All exposed fasteners shall be Phillips head or as otherwise specified, and shall match the finish of the adjacent hardware. All fasteners ex-posed to the weather shall be non-ferrous or stainless steel. Furnish correct fasteners to accommodate surrounding conditions.
- B. Coordinate required reinforcements for doors and frames. Seek approval of the architect prior to furnishing through-bolts. Furnish through-bolts as required for materials not readily reinforced.

2.2 BUTT HINGES

- A. Acceptable manufacturers and respective catalog numbers:

| | <u>Ives</u> | <u>Stanley</u> | <u>Hager</u> | <u>McKinney</u> |
|---|-------------|----------------|--------------|-----------------|
| 1. Standard Weight, Plain Bearing | 5PB1 | F179 | 1279 | T2714 |
| 2. Standard Weight, Ball Bearing | 5BB1 | BB179 | BB1279 | TB2714 |
| 3. Standard Weight, Ball Bearing, Non-Ferrous | 5BB1 | FBB191 | BB1191 | TB2314 |
| 4. Heavy Weight, Ball Bearing | 5BB1HW | FBB168 | BB1168 | T4B3786 |
| 5. Heavy Weight, Ball Bearing, Non-Ferrous | 5BB1HW | FBB199 | BB1199 | T4B3386 |

- B. Hinges shall be independently certified by ANSI for compliance with ANSI A156.1 (2006). Hinges shall meet or exceed the following ANSI grade requirements as indicated below:
 - 1. Standard Weight, Plain Bearing Hinges: Grade 3
 - 2. Standard Weight, 2 Ball Bearing Hinges: Grade 2
 - 3. Heavy Weight, 4 Ball Bearing Hinges: Grade 1
- C. Unless otherwise specified, furnish the following hinge quantities for each door leaf.
 - 1. 3 hinges for doors up to 90 inches.
 - 2. 1 additional hinge for every 30 inch on doors over 90 inches.
 - 3. 4 hinges for Dutch door applications.
- D. Unless otherwise specified, top and bottom hinges shall be located as specified in division 8 Section "Hollow Metal Doors and Frames". Intermediate hinges shall be located equidistant from others.
- E. Unless otherwise specified, furnish hinge weight and type as follows:
 - 1. Standard weight: plain bearing hinge 5PB1 for interior openings through 36 inches wide without a door closer.

- 2. Standard weight: ball bearing hinge 5BB1 for interior opening over 36 through 40 inches wide without a door closer, and for interior openings through 40 inches wide with a door closer.
- 3. Heavyweight: 4 ball bearing hinge 5BB1HW for interior openings over 40 inches wide, and for all vestibule doors.
- 4. Heavyweight: 4 ball bearing hinge 5BB1HWss for exterior openings unless otherwise listed in groups.
- F. Unless otherwise specified, furnish hinges for exterior doors, fabricated from brass, bronze, or stainless steel. Unless otherwise specified, hinges for interior doors may be fabricated from steel.
- G. Unless otherwise specified, furnish hinges in the following sizes:
 - 1. 5" x 5" 2-1/4" thick doors
 - 2. 4-1/2" x 4-1/2" 1-3/4" thick doors
 - 3. 3-1/2" x 3-1/2" 1-3/8" thick doors
- H. Furnish hinges with sufficient width to accommodate trim and allow for 180-degree swing.
- I. Unless otherwise specified, furnish hinges with flat button tips with non-rising pins at interior doors, non-removable loose pins (NRP) at exterior, and out-swinging lockable interior doors.
- J. Unless otherwise specified, furnish all hinges to template standards.

2.3 CONTINUOUS PIN AND BARREL HINGES

- A. Acceptable manufacturers and respective catalog numbers:

| | | | | |
|---|-------------|---------------|----------------|-----------------|
| | <u>Ives</u> | <u>Marker</u> | <u>Stanley</u> | <u>McKinney</u> |
| 1. Edge Mount Pin & Barrel Stainless Steel Continuous Hinge | 700 Series | 300 Series | 650 Series | 300 Series |
- B. Hinges shall be independently certified by ANSI for compliance with ANSI A156.26, Grade 1 (2012).
- C. Continuous hinges shall be full height pin and barrel type hinge providing full height door support up to 600 lbs. Edge mount (unless noted otherwise).
- D. Construct hinges of heavy-duty 14-gauge material. The stainless internal pin shall have a diameter of 0.25 and the exterior barrel diameter of 0.438.
- E. Hinge shall be non-handed with symmetrical template hole pattern and factory drilled. Hinge must accept a minimum of 21 fasteners on the door and 21 fasteners on the frame.
- F. Each knuckle to be 2 inch, including split nylon bearing at each separation for quiet, smooth, self-lubricating operation.
- G. Hinge to be able to carry Warnock Hersey Int. or UL for fire rated doors and frames up to 3 hours.
- H. Provide machine screws for doors which have been reinforced to accept machine screws.
- I. Note: Fire label for doors and frames should be placed on the header and top rail of fire rated doors and frames.
- J. Provide adjusting screws equal to Ives "Adjust-a-Stud" for continuous hinges specified as 705. Adjustment to be able to correct frame fit problems up to 3/8 inch.

2.4 POWER TRANSFERS

- A. Acceptable manufacturers and respective catalog numbers:

| | | | |
|----------------------------|-------------------|-------------|---------------|
| | <u>Von Duprin</u> | <u>ASSA</u> | <u>ABH</u> |
| 1. Concealed Two Wire | EPT-2 | CEPT-10 | PT200 |
| 2. Concealed Ten Wire | EPT-10 | CEPT-10 | PT1000 |
| 3. Concealed (Narrow Face) | **** | **** | PT105 / PT180 |

- | | | | |
|--------------------------------|---------|-------|------|
| 4. Armored Door Cord Four Wire | 788C-12 | TSB-C | **** |
| 5. Armored Door Cord Four Wire | 788C-18 | TSB-C | **** |
- B. Door cords shall be armored cable with screw on caps.
 - C. Concealed power transfers shall be concealed in the door and frame when the door is closed.
 - D. Concealed power transfers shall have a steel tube to protect wires from being cut.
 - E. Concealed power transfers with spring tubes shall be rejected.
 - F. Concealed power transfers shall be supplied with a mud box to house all terminations.

2.5 FLUSH BOLTS AND DUST PROOF STRIKES

A. Acceptable manufacturers and respective catalog numbers:

| | <u>Ives</u> | <u>Door Controls</u> | <u>Hager</u> |
|--|-------------|----------------------|--------------|
| 1. Dust Proof Strike | DP2 | 80 | 280X |
| 2. Auto Flush Bolt (Metal Door) | FB31P | 842 | 292D |
| 3. Auto Flush Bolt (Wood Door) | FB41P | 942 | 291D |
| 4. Constant Latching Bolt (Metal Door) | FB51P | 845 | 293D |
| 5. Constant Latching Bolt (Wood Door) | FB61P | 945 | 294D |
| 6. Manual Flush Bolt | FB458 | 780 | 282D |

- B. Unless otherwise specified, provide 12" rods for manual flush bolts for door 7'6" or less, 24" top rods for doors over 7'6" to 8'6".
- C. Unless otherwise specified, provide doors over 8'6" with automatic top bolts.
- D. Provide automatic flush bolts where required to maintain fire door listing and or egress requirements on pairs of doors.
- E. All flush-bolt applications shall be UL listed to be installed with top flush-bolt only. Provide auxiliary fire bolt as required for fire rated openings where less bottom bolt has been specified.
- F. Provide all bottom flush bolts with non-locking dust proof strikes.

2.6 EXIT DEVICES

A. Acceptable manufacturers and respective catalog numbers:

| | <u>Von Duprin</u> | <u>Falcon</u> | <u>Corbin</u> |
|---|--------------------|--------------------|------------------------|
| 1. Wide Stile, Push Pad | 98 / 99 Series | 25 Series | ED5000-M110 Series |
| 2. Wide Stile, Electric Latch Retraction (motor driven) | QEL 98 / 99 Series | MEL 25 Series | MEL ED5000-M110 Series |
| 3. Lever Trim | 996 Series | 510L / 511L Series | 900 Series |
| 4. Pull Trim | 990 Series | 512 Series | 1300 Series |

- A. Exit devices shall be independently certified by ANSI for compliance with ANSI A156.3, Grade 1 (2008).
- B. Obtain exit devices from a single manufacturer, although several may be indicated as offering products complying with requirements.
- C. All exit devices shall be equipped with a sound-dampening feature to reduce touch pad return noise.
- D. Quiet Electric Latch Retraction shall be accomplished using a motor driven assembly, and shall incorporate the following features:
 1. Motor shall retract both the push pad assembly and latchbolt.
 2. Automatic calibration of latch throw and pull.
 3. Built-in time delay.
 4. On-board installation and troubleshooting diagnostics built into power supply and device.

- 5. Retry mode if device does not pull on the first try.
- E. All exit devices shall be provided with flush end caps to reduce potential damage from impact.
- F. All exit devices shall be provided with dead-locking latch bolts to ensure security.
- G. All exit devices shall be U.L. listed for accident hazard. Exit device for use on fire doors shall also be U.L. listed for fire exit hardware.
- H. Provide optional strikes, special length rods, and adapter plates to accommodate door and frame conditions. Provide narrow style series devices in lieu of wide stile series devices where optional strikes will not accommodate door and frame conditions.
- I. Coordinate with related trades to ensure adequate clearance and reinforcement is provided in doors and frames. Provide thru bolts as required.
- J. Refer to hardware groups for exit device applications utilizing the option of: "less bottom rod and floor strike" (LBR)
- K. All exit devices shall be provided with optional trim designs to match other lever and pull designs used on the project.
- L. Unless specific exit device dogging options are noted within hardware sets, provide dogging options as follows:
 - 1. Fire Rated devices: Dogging not permitted.
 - 2. Non-Rated Exit Only functions not equipped with outside trim or pull: Less Dogging.
 - 3. Non-Rated Classroom functions: Less Dogging.
 - 4. Non-Rated devices utilizing electric latch retraction or electrified outside trim: Less Dogging.
 - 5. All Other Non-Rated devices: Cylinder Dogging utilizing interchangeable core cylinders. Cylinder keyway shall match locksets furnished on this project.
- M. Provide glass bead kits as required to accommodate door conditions. Screws shall not be visible through full glass doors.
- N. Where specified, provide compatible keyed mullions with cylinder for pairs of doors.
- O. Provide reinforced crossbars for all traditional style exit devices applied to doors over 36" wide.

2.7 LOCKS AND LATCHES

- A. Acceptable manufacturers and respective catalog numbers:

| | |
|------------------------|----------------|
| | <u>Schlage</u> |
| 1. Grade 1 Mortise | L Series 06A |
| 2. Grade 1 Cylindrical | ND Series RHO |
| 3. Grade 2 Cylindrical | AL Series SAT |
| 4. Grade 2 Tubular | F Series ELA |
| 5. Grade 2 Deadbolt | B500 Series |
- B. Bored locks shall be independently certified by ANSI for compliance with ANSI A156.2 (2011). Interconnected locks shall be independently certified by ANSI for compliance with ANSI A156.12 (2013). Mortise locks shall be independently certified by ANSI for compliance with ANSI A156.13 (2012).
- C. Minimize transmission of heat to lock trim. Provide temperature control modules (TCM) on all electrified locks when cataloged by the lock manufacturer.
- D. Unless otherwise specified, all locks and latches to have:
 - 1. 2-3/4" Backset
 - 2. 1/2" minimum throw latchbolt
 - 3. 1" throw deadbolt
 - 4. 6 pin cylinders
 - 5. ANSI A115.2 strikes

- E. Provide guarded latch bolts for all locksets, and latch bolts with sufficient throw to maintain fire rating of both single and paired door assemblies.
- F. Length of strike lip shall be sufficient to clear surrounding trim.
- G. Provide wrought boxes for strikes at inactive doors, wood frames, and metal frames without integral mortar covers.

2.8 PULLS, PUSH BARS, PUSH/PULL PLATES

A. Acceptable manufacturers and respective catalog numbers:

| | <u>Burns</u> | <u>Hager</u> | <u>Ives</u> |
|---|--------------|--------------|---------------|
| 1. Straight Pull (1" dia., 10" ctc) | 26C | 4J | 8103-0 |
| 2. Straight Pull (3/4" dia., 8" ctc) | 25B | 3G | 8102-8 |
| 3. Offset Door Pull (1" dia., 10" ctc) | 39C | 12J | 8190-0 |
| 4. Pull / Push-Bar (1" dia., 10" ctc Pull) | 422 x 26C | 153 | 9103-0 |
| 5. Offset Pull / Push-Bar (1" dia., 10" ctc Pull) | 422 x 39C | 159 | 9190-0 |
| 6. Push Plate (.050 4"X 16") | 54 | 30S 4 x 16 | 8200 4 x 16 |
| 7. Push Plate (.050 6"X 16") | 56 | 30S 6 x 16 | 8200 6" X 16" |

- A. Adjust dimensions of push plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, push plates shall be factory drilled for cylinders or other mortised hardware. All push plates shall be beveled 4 sides and counter sunk.
- B. Where possible, provide back-to-back, and concealed mounting for pulls and push bars. Push bar length shall be 3" less door width, or center of stile to center of stile for stile & rail or full glass doors.

2.9 CLOSERS

A. Acceptable manufacturers and respective catalog numbers:

| | <u>LCN</u> | <u>Yale</u> | <u>Norton</u> |
|----|---------------|--------------|----------------|
| 1. | 4050/4050 EDA | R4400/PR4400 | R7500 / PR7500 |
| 3. | 1250 SLIM | 51 P | 1600 P |

- B. Door closers shall be independently certified by ANSI for compliance with ANSI A156.4, Grade 1 (2013).
- C. Obtain door closers from a single manufacturer, although several may be indicated as offering products complying with requirements.
- D. Provide extra heavy duty arm (EDA / HD) when closer is to be installed using parallel arm mounting.
- E. Hardware supplier shall coordinate with related trades to ensure aluminum frame profiles will accommodate specified door closers.
- F. Closers shall use aluminum cylinders.
- G. Closers for fire-rated doors shall be provided with temperature stabilizing fluid that complies with standards UL10C.
- H. Unless otherwise specified, all door closers shall have full covers and separate adjusting valves for sweeps, latch, and backcheck.
- I. Provide closers for all labeled doors. Provide closer series and type consistent with other closers for similar doors specified elsewhere on the project.
- J. Provide closers with adjustable spring power. Size closers to ensure exterior and fire rated doors will consistently close and latch doors under existing conditions. Size all other door closers to allow for reduced opening force not to exceed 5 lbs.

- K. Install closers on the room side of corridor doors, stair side of stairways and interior side of exterior doors.
- L. Closers shall be furnished complete with all mounting brackets and cover plates as required by door and frame conditions, and by adjacent hardware.

2.10 KICK PLATES AND MOP PLATES

- A. Furnish protective plates as specified in hardware groups.
- B. Where specified, provide 10" kick plates, 34" armor plates, and 4" mop plates. Unless otherwise specified, metal protective plates shall be .050" thick; plastic plates shall be 1/8" thick.
- C. Protective plates shall be 2" less door width, or 1" less door width at pairs. All protective plates shall be beveled 4 sides and counter sunk.
- D. Protection plates over 16" shall not be provided for labeled doors unless specifically approved by door manufacturers listing. When protection plates over 16" are provided for labeled doors, the plate shall be labeled.
- E. Where specified, provide surface mounted door edges. Edges shall butt to protective plates. Provide edges with cutouts as required adjacent hardware.
- F. Adjust dimensions of protection plates to accommodate stile and rail dimensions, lite and louver cutouts, and adjacent hardware. Where required by adjacent hardware, protection plates shall be factory drilled for cylinders or other mortised hardware.
- G. Where wall stops are not applicable, furnish overhead stops.
- H. Do not provide holder function for labeled doors.

2.11 OVERHEAD STOPS (Common Areas)

- A. Acceptable manufacturers and respective catalog numbers:

| | | | |
|-------------------------------|----------------------|---------------|----------------|
| | <u>Glynn-Johnson</u> | <u>Rixson</u> | <u>Sargent</u> |
| 1. Heavy Duty Surface Mount | GJ900 Series | 9 Series | 590 |
| 2. Heavy Duty Concealed Mount | GJ100 Series | 1 Series | 690 |
- B. Unless otherwise specified, furnish GJ900 series overhead stop for hollow metal or 1-3/4" solid core doors equipped with regular arm surface type closers that swing more than 140 degrees before striking a wall, for hollow metal or 1-3/4" solid core doors that open against equipment, casework, sidelights, or other objects that would make wall bumpers inappropriate, and as specified in hardware groups.
- C. Furnish sex bolt attachments for wood and mineral core doors unless doors are supplied with proper reinforcing blocks.
- D. Do not provide holder function for labeled doors.

2.12 WALL STOPS AND HOLDERS (Common Areas)

- A. Acceptable manufacturers and respective catalog numbers:

| | | | |
|------------------------------|-------------|--------------|--------------|
| | <u>Ives</u> | <u>Hager</u> | <u>Burns</u> |
| 1. Wrought Convex Wall Stop | WS406CVX | 232W | 570 |
| 2. Wrought Concave Wall Stop | WS406CCV | 236W | 575 |
- B. Furnish a stop or holder for all doors.
- C. Where wall stops are not applicable, furnish overhead stops.
- D. Do not provide holder function for labeled doors.

2.13 DOOR STOPS (Unit Entry and Unit Interior Doors)

- A. Acceptable manufacturers and respective catalog numbers.

| | | | |
|--|-------------|--------------|--------------|
| | <u>Ives</u> | <u>Hager</u> | <u>Burns</u> |
|--|-------------|--------------|--------------|

| | | | |
|------------------------------|----------|------|------|
| 1. Wrought Concave Wall Stop | WS406CCV | 236W | 575 |
| 2. Flexible Door Stop | 060 | 324W | 509 |
| 3. Hinge Pin Stop | 70 | **** | **** |

- B. Where solid core doors are utilized, provide door stops as follows:
1. Provide Ives WS406/407 wall stop where lever shaft will contact wall, or where adjacent stub wall would permit wall stop to be placed such that it would make contact with the face of the door at a point greater than 75% of door width when measured from the hinge edge of the door.
 2. Provide Ives 060 flexible door stop where concave wall stop cannot be applied.
 3. Provide Ives 70 hinge pin where flexible door stop cannot be applied.

2.14 MAGNETIC HOLD OPENS

- A. Acceptable manufacturers and respective catalog numbers:
- | | | | |
|----------------|------------|------------|----------------|
| | <u>LCN</u> | <u>ABH</u> | <u>Edwards</u> |
| 1. Wall Holder | SEM 7800 | 2000 | 1500 |
- B. Magnetic hold opens shall be independently certified by ANSI for compliance with ANSI A156.15, Grade 1 (2006).
- C. Magnetic holder's housing and armature shall be constructed of a die cast zinc material.
- D. Provide types as listed in groups.
- E. Where wall conditions do not permit the armature to reach the magnet, provide extensions.
- F. Provide proper voltage and power consumption as required by Division 16.
- G. Coordinate electrical requirements and mounting locations with other trades.

2.15 WEATHERSTRIP, GASKETING

- A. Acceptable manufacturers and respective catalog numbers:
- | | | | | |
|-----------------------|-------------|--------------|------------|--------------|
| | <u>Zero</u> | <u>Pemko</u> | <u>NGP</u> | <u>Reese</u> |
| 1. Weatherstrip | 429 | 2891_PK | 700NA | 755 |
| 2. Adhesive Gasket | 188 | S88 | 5050 | 797 |
| 3. Meeting Edge Seals | 8193 | 18041 | 9605 | 959 |
| 4. Adhesive Edge Seal | 188S | S771 | 5060 | **** |
| 5. Sweep | 39 | 315_N | 200N | 323 |
| 6. Sweep w/ drip | 8198 | 345_N | C627 | 354 |
| 7. Drip Cap | 142 | 346 | 16 | R201 |
- B. Weatherstrip and gasketing shall be independently certified by ANSI for compliance with ANSI A156.22 (2005).
- C. Where specified in the hardware groups, furnish the above products unless otherwise detailed in groups.
- D. Provide weatherstripping all exterior doors and where specified.
- E. Provide intumescent and other required edge sealing systems as required by individual fire door listings to comply with positive pressure standards UL 10C.
- F. Provide Zero 188 smoke gaskets at all fire rated doors and smoke and draft control assemblies.
- G. Provide gasketing for all meeting edges on pairs of fire doors. Gasketing shall be compatible with astragal design provided by door supplier as required for specific fire door listings.

2.16 THRESHOLDS

- A. Acceptable manufacturers and respective catalog numbers:
- | | | | | |
|----------------------|-------------|--------------|------------|--------------|
| | <u>Zero</u> | <u>Pemko</u> | <u>NGP</u> | <u>Reese</u> |
| 1. Saddle Thresholds | 8655 | 171 | 425 | S205 |

| | | | | |
|---------------------------|------|-----|-------|------|
| 2. Half Saddle Thresholds | 1674 | 227 | 324 | S239 |
| 3. Interlocking Threshold | 74A | 114 | 442-5 | T550 |
| 4. ¼" Saddle Thresholds | 63 | 151 | 411 | S263 |

- A. Thresholds shall be independently certified by ANSI for compliance with ANSI A156.21 (2001).
- B. Hardware supplier shall verify all finish floor conditions and coordinate proper threshold as required to ensure a smooth transition between threshold and interior floor finish.
- C. Threshold Types:
 - 1. Unless otherwise specified, provide saddle threshold similar to Zero 8655 for all exterior openings with an interior floor finish less than or equal to 1/4" in height.
 - 2. Unless otherwise specified, provide half saddle threshold similar to Zero 1674 for all exterior openings with an interior floor finish greater than 1/4" in height. Threshold height shall match thickness of interior floor finish.

2.17 ELECTRIC STRIKES

- A. Acceptable manufacturers and respective catalog numbers:

| | | |
|-----------|-------------------|---------------------|
| | <u>Von Duprin</u> | <u>Folger Adams</u> |
| 1. Type 1 | 6000 Series | 300 Series |
- B. Provide electric strikes designed for use with the type of locks shown at each opening where specified.
- C. Electric strikes shall be UL listed as Burglary-Resistant Electric Door Strikes and where required shall be UL listed as Electric Strike for Fire Doors.
- D. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

2.18 POWER SUPPLIES

- A. Provide quantities and types as specified in hardware sets. Shared power supplies will not be accepted without prior approval from the owner.
- B. All power supplies shall have the following features:
 - 1. 12/24 VDC Output, field selectable.
 - 2. Class 2 Rated power limited output.
 - 3. Universal 120-240 VAC input.
 - 4. Low voltage DC, regulated and filtered.
 - 5. Polarized connector for distribution boards.
 - 6. Fused primary input.
 - 7. AC input and DC output monitoring circuit w/LED indicators.
 - 8. Cover mounted AC Input indication.
 - 9. Tested and certified to meet UL294.
 - 10.NEMA 1 enclosure.
 - 11.Hinged cover w/lock down screws.
 - 12.High voltage protective cover.
- C. All power supplies shall incorporate fused distribution boards.
- D. All electro-mechanical systems requiring fail safe circuits shall be capable of interfacing with the fire alarm system to cut power to appropriate system components. Unless already provided in another system component, all power supplies utilized in fail safe circuits shall include an integral relay which when connected to the N/C fire alarm contact will cut power to all openings connected to the individual power supply. Power supply, unless otherwise specified, will automatically reset itself when fire alarm relay returns to normal state following a fire alarm.

2.19 SLIDING DOOR HARDWARE

- A. Acceptable Manufacturers and respective catalog numbers (Heavy Duty):

K.N. Crowder

- 1. Kit As specified
- B. Provide complete hardware sets for each opening specified with sliding door hardware. Include track, ball-bearing hangers, door stops, fasteners, guides, and all hardware required for a complete installation.
- C. Hardware supplier shall coordinate with related trades to ensure that wall pocket framing will accommodate specified hardware.

2.20 FINISHES AND BASE MATERIALS

- A. Unless otherwise indicated in the hardware groups or herein, hardware finishes shall be applied over base metals as specified in the following finish schedule:

| <u>HARDWARE ITEM</u> | <u>BHMA FINISH AND BASE MATERIAL</u> |
|---|--------------------------------------|
| 1. Butt Hinges: Exterior, or Non-Ferrous | 630 (US32D - Satin Stainless Steel) |
| 2. Butt Hinges: Interior | 652 (US26D - Satin Chromium) |
| 3. Continuous Hinges | 630 (US32D - Satin Stainless Steel) |
| 4. Flush Bolts | 626 (US26D - Satin Chromium) |
| 5. Exit Devices | 626 (US26D - Satin Chromium) |
| 6. Locks and Latches | 626 (US26D - Satin Chromium) |
| 7. Pulls and Push Plates/Bars | 630 (US32D - Satin Stainless Steel) |
| 8. Closers | 689 (Powder Coat Aluminum) |
| 9. Protective Plates | 630 (US32D - Satin Stainless Steel) |
| 10. Overhead Stops | 630 (US32D - Satin Stainless Steel) |
| 11. Wall Stops and Holders | 630 (US32D - Satin Stainless Steel) |
| 12. Thresholds | 628 (Mill Aluminum) |
| 13. Weather-strip, Sweeps Drip Caps (wood and hollow metal doors) | Aluminum Anodized |
| 14. Weather-strip, Sweeps Drip Caps (aluminum doors) | Match finish of aluminum doors. |
| 15. Magnetic Holders | Sprayed Aluminum |
| 16. Miscellaneous | 626 (US26D - Satin Chromium) |

2.21 KEYING

- A. Acceptable manufacturers and respective catalog numbers:
 - Schlage
 - 1. Everest 29
- B. Provide all locks and cylinders utilizing a patented keyway to prevent manufacturing and distribution of aftermarket key blanks by anyone other than factory authorized dealers.
- C. All locks under this section shall be keyed as directed by the owner to a new Restricted Patented Grand Master Key System.
- D. Keying shall be by lock manufacturer where permanent records shall be kept.
- E. Furnish a total of 2 keys per cylinder. Actual cut keys to be determined by owner.
- F. Master keys and control keys to be delivered by registered mail to the owner. Change keys shall be delivered in a set up key cabinet. Construction keys shall be delivered to the contractor.

2.22 KEY CABINETS

- A. Acceptable manufacturers and respective catalog numbers:

| | | |
|-----------------|--------------------|---------------|
| <u>Lund</u> | <u>Key Control</u> | <u>Telkee</u> |
| 1. 1200-1205 AA | M228-2480 | RWC-AWC |
- B. Furnish 1 each model 1200 or 1205 AA key cabinet with a capacity 1.5 times the number of key sets.
- C. Provide one key cabinet with at least one hook for each key set, plus additional hooks for 50% expansion.

- D. Furnish key cabinet complete with cam lock, permanent key tags, and change key cards.
- E. Hardware supplier shall prepare all key change index records, tag all keys and place permanent file keys in cabinet.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to installation of hardware, installer shall examine door frame installation to ensure frames have been set square and plumb. Installer shall examine doors, door frames, and adjacent wall, floor, and ceiling for conditions, which would adversely affect proper operation and function of door assemblies. Do not proceed with hardware installation until such deficiencies have been corrected.

3.2 INSTALLATION

- A. Before hardware installation, general contractor/construction manager shall coordinate a hardware installation seminar with a 1 week notice to all parties involved. The seminar is to be conducted on the installation of hardware, specifically of locksets, closers, exit devices, continuous hinges and overhead stops. Manufacturer's representative of the above products to present seminar. Seminar to be held at the job site and attended by installers of hardware (including low voltage hardware) for aluminum, hollow metal and wood doors. Training to include use of installation manuals, hardware schedule, templates and physical products samples.
- B. Install all hardware in accordance with the approved hardware schedule and manufacturers instructions for installation and adjustment.
- C. Set units level, plumb and true to the line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accord with industry standards.
- E. Drill appropriate size pilot holes for all hardware attached to wood doors and frames.
- F. Shim doors as required to maintain proper operating clearance between door and frame.
- G. Unless otherwise specified, locate all hardware in accordance with the recommended locations for builders hardware for standard doors and frames as published by the Door and Hardware Institute.
- H. Use only fasteners supplied by or approved by the manufacturer for each respective item of hardware.
- I. Mortise and cut to close tolerance and conceal evidence of cutting in the finished work.
- J. Conceal push and pull bar fasteners where possible. Do not install through bolts through push plates.
- K. Install hardware on UL labeled openings in accordance with manufacturer's requirements to maintain the label.
- L. Apply self-adhesive gasketing on frame stop at head & latch side and on rabbet of frame at hinge side.
- M. Install hardware in accordance with supplemental "S" label instructions on all fire rated openings.
- N. Install wall stops to contact lever handles or pulls. Do not mount wall stops on casework, or equipment.
- O. Where necessary, adjust doors and hardware as required to eliminate binding between strike and latchbolt. Doors should not rattle.

- P. Overhead stops used in conjunction with electrified hold open closers shall be templated and installed to coincide with engagement of closer hold open position.
- Q. Install door closers on corridor side of lobby doors, room side of corridor doors, and stair side of stairways.
- R. Adjust spring power of door closers to the minimum force required to ensure exterior and fire rated doors will consistently close and latch doors under existing conditions. Adjust all other door closers to ensure opening force does not to exceed 5 lbs.
- S. Adjust "sweep", "latch", & "back check" valves on all door closers to properly control door throughout the opening and closing cycle. Adjust total closing speed as required to comply with all applicable state and local building codes.
- T. Install "hardware compatible" (bar stock) type weatherstripping continuously for an uninterrupted seal. Adjust templating for parallel arm door closers, exit devices, etc., as required to accommodate weatherstripping.
- U. Unless otherwise specified or detailed, install thresholds with the bevel in vertical alignment with the outside door face. Notch and closely fit thresholds to frame profile. Set thresholds in full bed of sealant.
- V. Compress sweep during installation as recommended by sweep manufacturer to facilitate a water resistant seal.
- W. Deliver to the owner 1 complete set of installation and adjustment instructions, and tools as furnished with the hardware.

3.3 FIELD QUALITY CONTROL

- A. After installation has been completed, the hardware supplier and manufacturers representative for locksets, door closers, exit devices, and overhead stops shall check the project and verify compliance with installation instructions, adjustment of all hardware items, and proper application according to the approved hardware schedule. Hardware supplier shall submit a list of all hardware that has not been installed correctly.
- B. After installation has been completed, the hardware supplier and manufacturers representative shall meet with the owner to explain the functions, uses, adjustment, and maintenance of each item of hardware. Hardware supplier shall provide the owner with a copy of all wiring diagrams. Wiring diagrams shall be opening specific and include both a riser diagram and point to point diagram showing all wiring terminations.

3.4 ADJUSTMENT AND CLEANING

- A. At final completion, and when H.V.A.C. equipment is in operation, installer shall make final adjustments to and verify proper operation of all door closers and other items of hardware. . Lubricate moving parts with type lubrication recommended by the manufacturer.
- B. All hardware shall be left clean and in good operation. Hardware found to be disfigured, defective, or inoperative shall be repaired or replaced.

3.5 HARDWARE SCHEDULE

- A. The following schedule of hardware groups are intended to describe opening function. The hardware supplier is cautioned to refer to the preamble of this specification for a complete description of all materials and services to be furnished under this section.

HW SET: 01

| | | | | |
|---|----|--------------------|---------------------|-----|
| 1 | EA | CONT. HINGE | 700 | IVE |
| 1 | EA | PANIC HARDWARE | CD-25-R-NL-OP | FAL |
| 1 | EA | MULLION STABILIZER | 154 | VON |
| 2 | EA | IC CYLINDER | AS REQUIRED | SCH |
| 1 | EA | 90 DEG OFFSET PULL | 8190 10" | IVE |
| 1 | EA | OH STOP | 100S | GLY |
| 1 | EA | SURFACE CLOSER | 4050 EDA | LCN |
| 1 | EA | RAIN DRIP | 142 | ZER |
| 1 | EA | WEATHERSTRIP | BY DR/FR SUPPLIER | |
| 1 | EA | DOOR SWEEP W/DRIP | 8198 | ZER |
| 1 | EA | THRESHOLD | PROFILE AS REQUIRED | ZER |

FUNCTION: (NL) LATCHBOLT RETRACTED INSIDE BY EXIT DEVICE PUSH PAD AND OUTSIDE BY KEY IN CYLINDER. DOOR LOCKS WHEN KEY IS REMOVED AND DOOR IS CLOSED. ACCESS FROM EXTERIOR WHEN EXIT DEVICE PUSH PAD IS DOGGED DOWN.

HW SET: 02

| | | | | |
|---|----|--------------------|----------------------|-----|
| 1 | EA | CONT. HINGE | 700 | IVE |
| 1 | EA | PANIC HARDWARE | CD-25-R-NL-OP | FAL |
| 1 | EA | MULLION STABILIZER | 154 | VON |
| 2 | EA | IC CYLINDER | AS REQUIRED | SCH |
| 1 | EA | ELECTRIC STRIKE | 6300 FSE | VON |
| 1 | EA | 90 DEG OFFSET PULL | 8190 10" | IVE |
| 1 | EA | OH STOP | 100S | GLY |
| 1 | EA | SURFACE CLOSER | 4050 EDA | LCN |
| 1 | EA | RAIN DRIP | 142 | ZER |
| 1 | EA | WEATHERSTRIP | BY DR/FR SUPPLIER | |
| 1 | EA | DOOR SWEEP W/DRIP | 8198 | ZER |
| 1 | EA | THRESHOLD | PROFILE AS REQUIRED | ZER |
| 1 | EA | REMOTE RELEASE | BY SECURITY SUPPLIER | |

FUNCTION: (NL) LATCHBOLT RETRACTED INSIDE BY EXIT DEVICE PUSH PAD AND OUTSIDE BY KEY IN CYLINDER. DOOR LOCKS WHEN KEY IS REMOVED AND DOOR IS CLOSED. ACCESS FROM EXTERIOR WHEN EXIT DEVICE PUSH PAD IS DOGGED DOWN. REMOTE RELEASE CONTROLS ELECTRIC STRIKE.

HW SET: 03

| | | | | |
|---|----|---------------------|-------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | MANUAL FLUSH BOLT | MANUAL | IVE |
| 1 | EA | CONST LATCHING BOLT | FB51T | IVE |
| 1 | EA | DUST PROOF STRIKE | DP2 | IVE |
| 1 | EA | STOREROOM LOCK | L9080 LESS OUTSIDE TRIM | SCH |
| 1 | EA | DOOR PULL, 1" ROUND | 8103 10" | IVE |
| 1 | EA | OH STOP & HOLDER | 90H | GLY |
| 2 | EA | SURFACE CLOSER | 4050 SHCUSH | LCN |
| 2 | EA | KICKPLATE | 8400 10" X 1" LDW B-CS | IVE |
| 1 | EA | RAIN DRIP | 142 | ZER |
| 1 | EA | WEATHERSTRIP | 429 | ZER |
| 2 | EA | MEETING STILE SEAL | 8193 | ZER |
| 2 | EA | DOOR SWEEP W/DRIP | 8198 | ZER |
| 1 | EA | THRESHOLD | PROFILE AS REQUIRED | ZER |

FUNCTION: STOREROOM LOCK
 LATCHBOLT RETRACTED BY KEY OUTSIDE OR BY LEVER INSIDE. AUXILIARY LATCH DEADLOCKS
 LATCHBOLT WHEN DOOR IS CLOSED.

HW SET: 04

| | | | | |
|---|----|-------------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | STOREROOM LOCK | AL80 | SCH |
| 1 | EA | SURFACE CLOSER | 4050 SCUSH | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | RAIN DRIP | 142 | ZER |
| 1 | EA | WEATHERSTRIP | 429 | ZER |
| 1 | EA | DOOR SWEEP W/DRIP | 8198 | ZER |
| 1 | EA | THRESHOLD | PROFILE AS REQUIRED | ZER |

HW SET: 05

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | PASSAGE SET | AL10 | SCH |
| 1 | EA | SURFACE CLOSER | 4050 REG/EDA AS REQ | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | WALL STOP | WS406/407CCV | IVE |

FUNCTION: PASSAGE LATCH
 LATCHBOLT RETRACTED BY LEVER FROM EITHER SIDE AT ALL TIMES.

HW SET: 06

| | | | | |
|---|----|--------------------|---|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | PASSAGE SET | AL10 | SCH |
| 1 | EA | SURFACE CLOSER | 4050 RW/PA MOUNT @ CORRIDOR SIDE/180 DEG | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | FIRE/LIFE WALL MAG | SEM7800 | LCN |
| 1 | EA | GASKETING | 188S | ZER |

FUNCTION: PASSAGE LATCH
 LATCHBOLT RETRACTED BY LEVER FROM EITHER SIDE AT ALL TIMES.

HW SET: 07

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | PASSAGE SET | ND10S | SCH |
| 1 | EA | SURFACE CLOSER | 4050 REG/EDA AS REQ | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | WALL STOP | WS406/407CCV | IVE |
| 1 | EA | GASKETING | 188S | ZER |

FUNCTION: PASSAGE LATCH
LATCHBOLT RETRACTED BY LEVER FROM EITHER SIDE AT ALL TIMES.

HW SET: 08

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | PASSAGE SET | AL10 | SCH |
| 1 | EA | SURFACE CLOSER | 4050 CUSH | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |

FUNCTION: PASSAGE LATCH
LATCHBOLT RETRACTED BY LEVER FROM EITHER SIDE AT ALL TIMES.

HW SET: 09

| | | | | |
|---|----|---------------------|---|-----|
| | EA | HINGE | AS REQUIRED MATCH EXISTING PREP AND WEIGHT | IVE |
| 1 | EA | PASSAGE SET | AL10 | SCH |
| 1 | EA | WRAP | AS REQUIRED | |
| 1 | EA | SURFACE CLOSER | 4050 EDA | LCN |
| 1 | EA | GASKETING | 188S | ZER |
| 1 | EA | BALANCE OF HARDWARE | TO REMAIN | |

FUNCTION: PASSAGE LATCH
LATCHBOLT RETRACTED BY LEVER FROM EITHER SIDE AT ALL TIMES.

HW SET: 10

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | PASSAGE SET | ND10S | SCH |
| 1 | EA | OH STOP | 90S | GLY |
| 1 | EA | SURFACE CLOSER | 4050 RW/PA | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | GASKETING | 188S | ZER |

FUNCTION: PASSAGE LATCH
LATCHBOLT RETRACTED BY LEVER FROM EITHER SIDE AT ALL TIMES.

HW SET: 11

| | | | | |
|---|----|---------------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | DOOR PULL, 1" ROUND | 8103 10" | IVE |
| 1 | EA | PUSH PLATE | 8200 6" X 16" | IVE |
| 1 | EA | SURFACE CLOSER | 4050 CUSH | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |

HW SET: 12

| | | | | |
|---|----|---------------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 2 | EA | DOOR PULL, 1" ROUND | 8103 10" | IVE |
| 2 | EA | PUSH PLATE | 8200 6" X 16" | IVE |
| 2 | EA | SURFACE CLOSER | 4050 SCUSH | LCN |
| 2 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 2 | EA | MEETING STILE SEAL | 8193 | ZER |
| 1 | EA | GASKETING | 188S | ZER |

HW SET: 13

| | | | | |
|---|----|---------------------|----------------------------|-----|
| 1 | EA | FASCIA & END CAPS | C-110 | KNC |
| 1 | EA | BARN DOOR KIT | C-994-108 KIT | KNC |
| 1 | EA | STOP W/CATCH | CDC-911 | KNC |
| 1 | EA | DOOR PULL, 3/4" RND | 8102 6" BACK TO BACK MOUNT | IVE |

HW SET: 14

| | | | | |
|---|----|-------------------|-------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 2 | EA | MAGNETIC CATCH | 327 | IVE |
| 2 | EA | SINGLE DUMMY TRIM | F170 | SCH |
| 2 | EA | STOP | AS REQUIRED | IVE |

HW SET: 15

| | | | | |
|---|----|------------------|----------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | PASSAGE SET | AL10 | SCH |
| 1 | EA | SGL CYL DEADBOLT | B560 | SCH |
| 1 | EA | SURFACE CLOSER | 1250 RW/PA SLIM | LCN |
| 1 | EA | STOP | AS REQUIRED | IVE |
| 1 | EA | DOOR SWEEP | 39 | ZER |
| 1 | EA | THRESHOLD | 63 | ZER |
| 1 | EA | GASKETING | 188S | ZER |
| 1 | EA | VIEWER | U698 (2) AT HC UNITS | IVE |

FUNCTION: PASSAGE LATCH
 LATCHBOLT RETRACTED BY LEVER FROM EITHER SIDE AT ALL TIMES.
 DEADBOLT RETRACTED AND PROJECTED BY KEY OUTSIDE OR THUMBTURN INSIDE.
 AT EXISTING FRAMES: MATCH EXISTING HINGE PREP AND WEIGHT

HW SET: 16

| | | | | |
|---|----|--------------|-------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | PRIVACY LOCK | F40 | SCH |
| 1 | EA | STOP | AS REQUIRED | IVE |

HW SET: 17

| | | | | |
|---|----|-------------|-------------|-----|
| 1 | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | PASSAGE SET | F10 | SCH |
| 1 | EA | STOP | AS REQUIRED | IVE |

FUNCTION: PASSAGE LATCH
LATCHBOLT RETRACTED BY LEVER FROM EITHER SIDE AT ALL TIMES.

HW SET: 18

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | PRIVACY LOCK | AL40 | SCH |
| 1 | EA | SURFACE CLOSER | 4050 RW/PA | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | WALL STOP | WS406/407CCV | IVE |
| 1 | EA | DOOR SWEEP | 39 | ZER |
| 1 | EA | THRESHOLD | 63 | ZER |
| 1 | EA | GASKETING | 188S | ZER |

FUNCTION: BATH/BEDROOM PRIVACY LOCK
PUSH-BUTTON LOCKING. CAN BE OPENED FROM OUTSIDE WITH SMALL SCREWDRIVER. TURNING INSIDE LEVER OR CLOSING DOOR RELEASES BUTTON.

HW SET: 19

| | | | | |
|---|----|---------------------|---|-----|
| | EA | HINGE | AS REQUIRED MATCH EXISTING PREP AND WEIGHT | IVE |
| 1 | EA | ENTRANCE LOCK | AL53 | SCH |
| 1 | EA | WRAP | AS REQUIRED | |
| 1 | EA | BALANCE OF HARDWARE | TO REMAIN | |

FUNCTION: ENTRANCE LOCK
TURN/PUSH-BUTTON LOCKING: PUSHING AND TURNING BUTTON LOCKS OUTSIDE LEVER REQUIRING USE OF KEY UNTIL BUTTON IS MANUALLY UNLOCKED. PUSH-BUTTON LOCKING: PUSHING BUTTON LOCKS OUTSIDE LEVER UNTIL UNLOCKED BY KEY OR BY TURNING INSIDE LEVER.

HW SET: 20

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | CLASSROOM LOCK | AL70 | SCH |
| 1 | EA | OH STOP | 90S | GLY |
| 1 | EA | SURFACE CLOSER | 4050 RW/PA | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |

FUNCTION: CLASSROOM LOCK
OUTSIDE LEVER LOCKED AND UNLOCKED BY KEY. INSIDE LEVER ALWAYS UNLOCKED.

HW SET: 21

| | | | | |
|---|----|----------------|--------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | STOREROOM LOCK | AL80 | SCH |
| 1 | EA | WALL STOP | WS406/407CCV | IVE |

FUNCTION: STOREROOM LOCK
LATCHBOLT RETRACTED BY KEY OUTSIDE OR BY LEVER INSIDE. OUTSIDE LEVER ALWAYS INOPERATIVE.

HW SET: 22

| | | | | |
|---|----|---------------------|---|-----|
| | EA | HINGE | AS REQUIRED MATCH EXISTING PREP AND WEIGHT | IVE |
| 1 | EA | STOREROOM LOCK | AL80 | SCH |
| 1 | EA | WRAP | AS REQUIRED | |
| 1 | EA | SURFACE CLOSER | 4050 EDA | LCN |
| 1 | EA | BALANCE OF HARDWARE | TO REMAIN | |

FUNCTION: STOREROOM LOCK
LATCHBOLT RETRACTED BY KEY OUTSIDE OR BY LEVER INSIDE. OUTSIDE LEVER ALWAYS INOPERATIVE.

HW SET: 23

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | STOREROOM LOCK | AL80 | SCH |
| 1 | EA | SURFACE CLOSER | 4050 REG/EDA AS REQ | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | WALL STOP | WS406/407CCV | IVE |

FUNCTION: STOREROOM LOCK
LATCHBOLT RETRACTED BY KEY OUTSIDE OR BY LEVER INSIDE. OUTSIDE LEVER ALWAYS INOPERATIVE.

HW SET: 24

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | STOREROOM LOCK | AL80 | SCH |
| 1 | EA | SURFACE CLOSER | 4050 REG/EDA AS REQ | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | WALL STOP | WS406/407CCV | IVE |
| 1 | EA | GASKETING | 188S | ZER |

FUNCTION: STOREROOM LOCK
LATCHBOLT RETRACTED BY KEY OUTSIDE OR BY LEVER INSIDE. OUTSIDE LEVER ALWAYS INOPERATIVE.

HW SET: 25

| | | | | |
|---|----|-------------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | POWER TRANSFER | EPT10 | VON |
| 1 | EA | STOREROOM LOCK | ND80EL | SCH |
| 1 | EA | OH STOP | 90S | GLY |
| 1 | EA | SURFACE CLOSER | 4050 RW/PA | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | GASKETING | 188S | ZER |
| 1 | EA | CARD READER | BY SECURITY SUPPLIER | |
| 1 | EA | POWER SUPPLY | PS902 2RS-FA | VON |
| 1 | EA | ELEVATION DRAWING | | |
| 1 | EA | WIRE DIAGRAM | POINT TO POINT | |
| 1 | EA | N/C FA CONTACT | BY F/A CONTRACTOR | |

FUNCTION: ELECTRICALLY LOCKED (FAIL SAFE)
OUTSIDE LEVER LOCKED BY 24V AC OR DC. LATCHBOLT RETRACTED BY KEY OUTSIDE OR LEVER INSIDE.
AUXILIARY LATCH DEADLOCKS LATCHBOLT WHEN DOOR IS CLOSED. INSIDE LEVER ALWAYS FREE FOR IMMEDIATE EXIT.
UPON LOSS OF POWER OR FIREALARM DOOR IS UNLOCKED.

HW SET: 26

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | STOREROOM LOCK | AL80 | SCH |
| 1 | EA | SURFACE CLOSER | 4050 CUSH | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | GASKETING | 188S | ZER |

FUNCTION: STOREROOM LOCK
LATCHBOLT RETRACTED BY KEY OUTSIDE OR BY LEVER INSIDE. OUTSIDE LEVER ALWAYS INOPERATIVE.

HW SET: 27

| | | | | |
|---|----|----------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | STOREROOM LOCK | AL80 | SCH |
| 1 | EA | SURFACE CLOSER | 4050 CUSH | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |

FUNCTION: STOREROOM LOCK
LATCHBOLT RETRACTED BY KEY OUTSIDE OR BY LEVER INSIDE. OUTSIDE LEVER ALWAYS INOPERATIVE.

HW SET: 28

| | | | | |
|---|----|-------------------|------------------------|-----|
| | EA | HINGE | AS REQUIRED | IVE |
| 1 | EA | POWER TRANSFER | EPT10 | VON |
| 1 | EA | STOREROOM LOCK | ND80EL | SCH |
| 1 | EA | OH STOP | 90S | GLY |
| 1 | EA | SURFACE CLOSER | 4050 RW/PA | LCN |
| 1 | EA | KICKPLATE | 8400 10" X 2" LDW B-CS | IVE |
| 1 | EA | GASKETING | 188S | ZER |
| 1 | EA | CARD READER | BY SECURITY SUPPLIER | |
| 1 | EA | POWER SUPPLY | PS902 2RS-FA | VON |
| 1 | EA | ELEVATION DRAWING | | |
| 1 | EA | WIRE DIAGRAM | POINT TO POINT | |
| 1 | EA | N/C FA CONTACT | BY F/A CONTRACTOR | |

FUNCTION: ELECTRICALLY LOCKED (FAIL SAFE)

OUTSIDE LEVER LOCKED BY 24V AC OR DC. LATCHBOLT RETRACTED BY KEY OUTSIDE OR LEVER INSIDE.
AUXILIARY LATCH DEADLOCKS LATCHBOLT WHEN DOOR IS CLOSED. INSIDE LEVER ALWAYS FREE FOR
IMMEDIATE EXIT.

UPON LOSS OF POWER OR FIREALARM DOOR IS UNLOCKED.

SECTION 08 8050

GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glass and plastic glazing.
- B. Plastic glazing film.
- C. Glazing compounds and accessories.

1.02 RELATED SECTIONS

- A. Section 07 9005 - Joint Sealers: Sealant and back-up material.
- B. Section 08 1113 - Hollow Metal Doors and Frames.
- C. Section 08 1416 - Flush Wood Doors: Glazed doors.
- D. Section 08 14 16 - Flush Wood Doors: Glazed doors.
- E. Section 08 43 13 - Aluminum-Framed Storefronts.

1.03 REFERENCES

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2004.
- C. ASTM C 864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005.
- D. ASTM C 1036 - Standard Specification for Flat Glass; 2006.
- E. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2004.
- F. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass; 2003.
- G. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005a.
- H. ASTM E 773 - Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units; 2001.
- I. ASTM E 774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units; 1997.
- J. ASTM E 1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2004.
- K. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2004.
- L. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 1990.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for submittal procedures for administrative requirements.
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- D. Warranty.

1.05 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.

1.06 WARRANTY

- A. See Section 01 7700 - Closeout Procedures for additional warranty requirements.

- B. A manufacturer's signed warranty is required for insulating units. The warranty shall cover replacement of units that are found defective within 10 years of the date of Substantial Completion. Defects shall include failure of the hermetic seal, deterioration of internal glass coatings and other indications of seal failure or non-performance, except where caused by breakage. Appearance of dirt, moisture, fogging or internal condensation at temperatures above -20 degrees F shall be considered conclusive evidence of defect. Replacement units shall be delivered to the project site without cost to the Owner.

PART 2 PRODUCTS

2.01 EXTERIOR GLAZING ASSEMBLIES

- A. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with ASCE 7.
1. Use the procedure specified in ASTM E 1300 to determine glass type and thickness.
 2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
 3. Thicknesses listed are minimum.

2.02 FLAT GLASS MATERIALS

- A. Manufacturers:
1. ACH Glass/Versalux: www.versaluxglass.com.
 2. AFG Industries, Inc: www.afgglass.com.
 3. Pilkington Building Products North America: www.pilkington.com.
 4. PPG Industries, Inc: www.ppg.com.
 5. TGP: www.fireglass.com.
 6. Cardinal Glass Industries: www.cardinalcorp.com.
 7. Substitutions: Refer to Section 01 2513 - Product and Substitution Procedures.
- B. Clear Float Glass (Type G1): Clear, annealed.
1. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
- C. Tempered Float Glass : Clear; fully tempered with horizontal tempering at interior borrowed lites.
1. Laminated with 0.030 inch thick plastic interlayer; comply with ASTM C 1172.
 2. Comply with ASTM C 1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select) and ASTM C 1048.
 3. Comply with 16 CFR 1201 test requirements for Category II.
 4. All tempered glass shall be heat soak tested by the manufacturer a minimum of two hours to minimize the potential of spontaneous breakage due to nickel sulfide inclusions.
 5. Glazing shall be tempered safety glazing at all locations required by building code including but not limited to:
 - a. Within 24 inches of a door (unless over 60" above floor).
 - b. When over 9 square feet and within 18 inches of floor.
 - c. Bathrooms.
 - d. Windows in walls enclosing or within 60" of a stairway or stair landing (unless over 60" above floor).
 6. Where glazing is to be installed in fire-rated partition, provide glazing that is also fire-protection rated in accordance with applicable code.
- D. Fire Rated Ceramic Glass(Type G3):
1. Manufacturers:
 - a. TGP: www.fireglass.com.
 - b. Vetrotech Saint-Gobain: www.vetrotech.com.
 - c. Substitutions: Refer to Section 01 2513 - Product and Substitution Procedures.
 2. Provide safety and insulated glass and/or impact rated glass unit where required.

2.03 SEALED INSULATING GLASS ASSEMBLIES

- A. Manufacturers:
 - 1. Any of the manufacturers listed under Flat Glass Materials.
 - 2. Substitutions: Refer to Section 01 2513 - Product and Substitution Procedures.
- B. Insulated Glass Units (Type G2): Double pane, low-E, argon filled, with glass to elastomer edge seal.
 - 1. Units composed of clear tempered float glass for both panes. Thickness of each pane shall be 1/4" with air space thickness of 1/2", argon filled, separated by manufacturer's standard sealing system. Spacer material shall be manufacturer's standard metal. Exterior glazing shall be low-E.
 - 2. Place reflective coating on No.2 surface within the unit.
 - 3. Visible light transmittance of 69 percent, shading coefficient of 0.44, and COG U-Factor of 0.27.
 - 4. Comply with ASTM E 774 and E 773, Class CBA.
 - 5. Purge interpane space with dry hermetic air.
 - 6. Total unit thickness of 1 inch minimum.

2.04 PLASTIC SHEET MATERIALS

- A. Manufacturers:
 - 1. Duralight Plastics: www.duralightplastics.com.
 - 2. Green-tek: www.green-tek.com.
 - 3. Ecologic Technologies: www.cloudtops.com.
 - 4. Substitutions: Refer to Section 01 2513 - Product and Substitution Procedures.
- B. Polycarbonate Sheet : Plastic compound, clear; ultraviolet stabilized.
 - 1. Acrylate non-yellowing coating for scratch resistance.
 - 2. Comply with ANSI Z97.1.
 - 3. Triple-wall, 5/8 inch thick panels.

2.05 PLASTIC FILMS

- A. Manufacturers:
 - 1. Decorative Films: Solyx; www.decorativefilm.com.
 - a. See Drawings for pattern.
 - 2. Substitutions: Refer to Section 01 2513 - Product and Substitution Procedures.
- B. Plastic Film: TBD type, TBD inch thick, visible light transmittance of TBD percent, solar light transmittance of TBD, shading coefficient of TBD percent.

2.06 GLAZING COMPOUNDS

- A. Silicone Sealant: Comply with sealant and glass manufacturers for selection of glass sealants which suit project application and installation conditions and which are compatible with surfaces contacted. Silicone rubber base sealant conforming to ASTM C920, Type S, Grade NS, Class 25, by Dow Corning Corporation, or GE.

2.07 GLAZING ACCESSORIES

- A. Cleaners, Primers, and Sealers: Type recommended by manufacturer of sealants/gaskets.
- B. Setting Blocks and Spacers: Neoprene, EPDM or silicone as required for compatibility with glazing sealants; of 80 to 90 Shore A hardness for setting blocks and, for spacers and edge blocks, of hardness recommended by glass and sealant manufacturer for application indicated.
- C. Glazing Tape, Gaskets, and Wedges: As recommended by window system manufacturer.
- D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I; black color at storefront. Color elsewhere to be selected by Architect.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings for glazing are correctly sized and within tolerance.

- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with ASTM C 1193 and FGMA Sealant Manual.
- E. Install sealant in accordance with manufacturer's instructions.

3.03 INSTALLATION

- A. Comply with referenced FGMA standards and instructions of manufacturers of glass, sealants, and gaskets, to achieve airtight and watertight performance, and to minimize breakage. Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics. Protect glass from contact with contaminating substances resulting from construction operations; remove any such substances by method approved by glass manufacturer. Glazing of aluminum entrance system to be in accordance with glass and curtain wall system manufacturer's instructions.
- B. Coordinate installation of hollow metal doors and frames with suppliers.
- C. Provide ceramic glass at all fire-rated interior borrowed light windows and door windows.
- D. Provide opaque glass at interior borrowed lights in bathrooms.

3.04 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

3.05 PROTECTION OF FINISHED WORK

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION 08 8050

**SECTION 08 8313
MIRRORED GLASS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glass mirrors.
- B. Glass mirror wall panels.

1.02 RELATED SECTIONS

- A. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Metal-framed mirrors.

1.03 REFERENCES

- A. ASTM C 1036 - Standard Specification for Flat Glass; 2001.
- B. GANA (TIPS) - Mirrors Handle with Extreme Care: Tips For the Professional on the Care and Handling of Mirrors; National Association of Mirror Manufacturers; 2004.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data on Mirror Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

1.05 WARRANTY

- A. See Section 01 7700 - Closeout Procedures for additional warranty requirements.
- B. Provide five year manufacturer warranty for reflective coating on mirrors and replacement of same.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Mirror Glass Panels - General: Select materials and/or provide supports as required to limit mirrored glass deflection to 1/200 or flexure limit of glass with full recovery of glazing materials, whichever is less.
- B. Mirror Glass Panels : Clear tempered safety type with copper and silver coating, organic overcoating, arrised edges, 6.4 mm thick minimum.
 - 1. Sizes noted on Drawings.
- C. Mirror Glass : ASTM C 1036, Type 1 transparent flat, Class 1 clear, Quality Q2 (mirror); conforming to FS DD-G-451D, with silvering, copper coating and organic protective coating with polished edges; 1/4 inches minimum thick.

2.02 GLAZING ACCESSORIES

- A. Mirror Attachment Clips: Knapp and Vogt # 277 and #278 chrome j-clips.
- B. Mirror Wall Panel Attachment Accessories: Stainless steel J-profile channels.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings for mirrored glazing are correctly sized and within tolerance.

3.02 INSTALLATION - GENERAL

- A. Install mirrors in accordance with NAMM recommendations and manufacturer's instructions for the substrate provided.
- B. Set mirrors plumb and level, free of optical distortion.
- C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

- D. Frameless Mirrors: Set mirrors with a minimum of four clips in a tamperproof manner. Anchor rigidly to appropriate substrate.

3.03 CLEANING

- A. Remove labels after Work is complete.
- B. Clean mirrors and adjacent surfaces.

END OF SECTION 08 8313

SECTION 08 9100

LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Louvers, frames, and accessories.

1.02 RELATED SECTIONS

- A. Section 07 6200 - Sheet Metal Flashing and Trim.
- B. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- C. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; 2012.
- D. AMCA 511 - Certified Ratings Program for Air Control Devices; 2010.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples, for submittal procedures.
- B. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.
- C. Samples: Submit two samples 2 by 2 inches in size illustrating finish and color of exterior and interior surfaces.
- D. Test Reports: Independent agency reports showing compliance with specified performance criteria.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wall Louvers:
 - 1. Airline Louvers: www.airlinelouvers.com/#sle.
 - 2. Airolite Company, LLC; Product Fabricated Stationary Louver: www.airolite.com/#sle.
 - 3. Construction Specialties, Inc: www.c-sgroup.com/#sle.
 - 4. Industrial Louvers, Inc: www.industriallouvers.com/#sle.
- B. Penthouse Louvers:
 - 1. Greenheck; www.greenheck.com.
- C. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 LOUVERS

- A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified under AMCA 511.
 - 1. Wind Load Resistance: Design to resist positive and negative wind load as required by code without damage or permanent deformation.
 - 2. Intake Louvers: Design to allow maximum of 0.01 oz/sq ft water penetration at calculated intake design velocity based on design air flow and actual free area, when tested in accordance with AMCA 500-L.
 - 3. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
 - 4. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.
- B. Louvers : Horizontal, extruded aluminum construction, with intermediate mullions matching frame. Airolite Louver Type K601D.

1. Free Area: 50 percent, minimum.
 2. Mechanical and operation requirements: As indicated by Division 23 and Mechanical Drawings.
 3. Blades: V-shaped, sight-proof, or as indicated by Division 23 and Mechanical Drawings.
 4. Frame: 4 inches deep; corner joints mitered and mechanically fastened, with continuous recessed caulking channel each side.
 5. Aluminum Thickness: Frame 12 gage, 0.0808 inch minimum; blades 12 gage, 0.0808 inch minimum.
 6. Size: As indicated on drawings.
 7. Finish: Fluoropolymer coating, finished after fabrication.
 8. Color: As selected from manufacturer's standard colors.
- C. Penthouse Louvers: Provide factory assembled Penthouse Louver for elevator vent - size to meet code requirements.

2.03 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).

2.04 FINISHES

- A. Superior Performing Organic Coatings: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
1. Manufacturers:
 - a. PPG Metal Coatings; Duranar: www.ppgmetalcoatings.com/#sle.
 - b. Sherwin-Williams Company; SHER-NAR 5000: oem.sherwin-williams.com/#sle.
 - c. Valspar; Fluropon: www.valsparcoilextrusion.com/#sle.
 2. Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, including minimum 70 percent PVDF color topcoat and minimum total dry film thickness of 0.9 mil; color and gloss as selected from manufacturer's standard line.
- B. Color: As selected from manufacturer's standard colors.

2.05 ACCESSORIES

- A. Blank-Off Panels: Aluminum face and back sheets, polyisocyanurate foam core, 1-1/2 inch thick, painted black on exterior side; provide where duct connected to louver is smaller than louver frame, sealing off louver area outside duct.
- B. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
- C. Bird Screen: Interwoven wire mesh of aluminum, 14 gage, 0.0641 inch diameter wire, 1/2 inch open weave, diagonal design.
- D. Insect Screen: 18 x 16 size aluminum mesh.
- E. Fasteners and Anchors: Galvanized steel.
- F. Head and Sill Flashings: See Section 07 6200.
- G. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared openings and flashings are ready to receive this work and opening dimensions are as indicated on shop drawings.
- B. Verify that field measurements are as indicated.

3.02 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Coordinate with installation of flashings by others.
- C. Install louvers level and plumb.

- D. Align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.
- E. Secure louver frames in openings with concealed fasteners.

3.03 ADJUSTING

- A. Adjust operable louvers for freedom of movement of control mechanism. Lubricate operating joints.

3.04 CLEANING

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

END OF SECTION 08 9100

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
 - 1. Metal stud wall framing.
- B. Metal furring.
- C. Shaft wall system.
- D. Acoustic insulation.
- E. Gypsum wallboard.
- F. Joint treatment and accessories.
- G. Acoustical Accessories.

1.02 RELATED SECTIONS

- A. Section 05 4000 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.
- B. Section 06 1000 - Rough Carpentry: Building framing .
- C. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
- D. Section 07 2100 - Insulation for acoustic insulation in party walls.
- E. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire rated walls.
- F. Section 07 9005 - Joint Sealers: Acoustic sealant.
- G. Section 09 9000 - Painting and Coating.
- H. Section 09 3000 - Tiling: Tile backing board.

1.03 REFERENCE STANDARDS

- A. ANSI A108.11-SystemDeleted - American National Standard for Interior Installation of Cementitious Backer Units; 2010 (Revised).
- B. ANSI A118.9-SystemDeleted - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2010).
- C. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.
- D. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2009).
- E. ASTM C 630/C 630M - Standard Specification for Water-Resistant Gypsum Backing Board; 2000.
- F. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014.
- G. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.
- H. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.
- I. ASTM C 919 - Standard Practice for Use of Sealants in Acoustical Applications; 1998.
- J. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.
- K. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.
- L. ASTM C1325 - Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units; 2014.
- M. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

- N. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010.
- O. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.
- P. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics; 2016.
- Q. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.
- R. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- S. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2015.
- T. ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source; 2016.
- U. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- V. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 2017.
- W. GA-216 - Application and Finishing of Gypsum Board; 2013.
- X. GA-600 - Fire Resistance Design Manual; 2015.
- Y. ICC (IBC) - International Building Code; 2015.
- Z. UL (FRD) - Fire Resistance Directory; current edition.

1.04 SYSTEM DESCRIPTION

- A. Acoustic Attenuation for Interior Partitions Indicated as Acoustic: STC indicated on drawings 45-49 calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.
- B. Shaft Wall: Configure and install components as required to achieve the following performance levels: two hour.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide data on gypsum board, accessories, and joint finishing system.
- C. Submit sample of actual finish for approval on 12" x 18" or larger sample board. Do a field sample for approval.
- D. Test Reports: For all stud framing products that do not comply with ASTM C645 or C 754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 3 years of experience.

1.07 REGULATORY REQUIREMENTS

- A. Conform to "UL Fire Resistance Manual" "Gypsum Association GA 600" and the Minnesota Building COMPONENTS Code for fire rated assemblies as indicated on drawings.

1.08 DELIVERY, STORAGE AND HANDLING

- A. All delivery shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.09 ENVIRONMENTAL REQUIREMENTS

- A. General: Comply with requirements of referenced standards and with gypsum board manufacture recommendations.
- B. Cold Weather Protection: When ambient outdoor temperatures are below 55 degrees F., maintain continuous, uniform, working temperature of not less than 55 degrees F. for a minimum period of 48 hours prior to, during, and following application of gypsum board and joint treatment materials or bonding adhesives.
- C. Ventilation: Ventilate building spaces as required to remove water in excess of that required for drying of joint treatment material immediately after its application. Avoid drafts during dry, hot weather to prevent too rapid drying.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions indicated as sound-rated: Provide completed assemblies with the following characteristics:
 - 1. Sound rating of wall assemblies shall meet or exceed STC ratings indicated on drawings.
- C. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
 - 1. Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
 - 2. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- D. Shaft Walls at Elevator Shafts: Provide completed assemblies with the following characteristics:
 - 1. Air Pressure Within Shaft: Intermittent loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
 - 2. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- E. Fire Rated Assemblies: Provide completed assemblies with the following characteristics:
 - 1. Fire rating of wall assemblies and floor/ceiling assemblies shall meet or exceed fire resistive ratings indicated on drawings.
 - 2. Gypsum Association File Numbers: Comply with requirements of the current edition of GA-600 for the particular assembly.
 - a. Provide test reports or other recognized documentation for assemblies that vary in materials, thickness, member spacing etc. from referenced GA File assembly number.
 - 3. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.
 - a. Provide test reports or other recognized documentation for assemblies that vary in materials, thickness, member spacing etc. from referenced UL assembly number.

2.02 METAL FRAMING MATERIALS

- A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
 - 1. Exception: The minimum metal thickness and section properties requirements of ASTM C645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E72 using assemblies specified by ASTM C754.
 - 2. Studs: "C" shaped with flat or formed webs with knurled faces.
 - 3. Runners: U shaped, sized to match studs.
 - 4. Ceiling Channels: C shaped, 1-1/2 inch.

5. Furring: Hat-shaped sections, minimum depth of 1/2 inch.
6. Resilient Furring Channels: Single leg configuration; 1/2 inch channel depth.
 - a. Products:
 - 1) ClarkDietrich; RC Deluxe Resilient Channel: www.clarkdietrich.com/#sle.
 - 2) No substitutions.
- B. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.
- C. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
- D. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and screwed to secondary deflection channel set inside but unattached to top track.

2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 1. CertainTeed Corporation: www.certainteed.com/#sle.
 2. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
 3. National Gypsum Company: www.nationalgypsum.com/#sle.
 4. USG Corporation: www.usg.com/#sle.
 5. Substitutions: 01 2513 - Product and Substitution Procedures.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 2. Type:
 - a. Type 'X', manufacturer's proprietary fire core 'C', and other types as indicated on drawings.
 3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, submit a UL or WH listed assembly for approval by architect.
 4. Thickness:
 - a. Vertical Surfaces: 5/8 inch and as indicated on drawings.
 - b. Ceilings: 5/8 inch and as indicated on drawings.
 - c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
- C. Backing Board For Wet Areas: One of the following products:
 1. Application: Surfaces behind tile in wet areas including walls in public toilets, and bathing suites.
 2. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9-SystemDeleted or ASTM C1325.
 - a. Thickness: 5/8 inch.
 - b. Products:
 - 1) USG Corporation; Durock Brand Cement Board.
 - 2) Substitutions: 01 2513 - Product and Substitution Procedures.
- D. Exposed Gypsum Wallboard: ASTM C 36/C 36M; Type X and manufacturer's proprietary Fire Core C, UL or WH rated; sizes to minimize joints in place; ends square cut.
 1. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
 2. Application: Where required for fire-rated assemblies, unless otherwise indicated.
 3. Thickness: As indicated on the drawings.
 4. Edges: Tapered.
- E. Exposed Mold-Resistant Gypsum Wallboard at wet walls: ASTM C 630/C 630M; Type X, UL or WH rated, ends square cut.
 1. Application: At all walls at custodial closets and wet areas 4'-0" up wall and above tub/shower surrounds, except behind tile (at tile surrounds, cement board by tile installer).

2. Edges: Tapered.
 3. Thickness: As indicated on the drawings.
- F. Shaftwall and Coreboard: Type X; 1 inch thick by 24 inches wide, beveled long edges, ends square cut.
1. Paper Faced Type: Gypsum shaftliner board or gypsum coreboard as defined ASTM C 1396/C 1396M; water-resistant faces.
 - a. American Gypsum; Shaft Liner.
 - b. National Gypsum Company; Gold Bond Brand 1" Fire-Shield Shaftliner.
 - c. National Gypsum Company; Gold Bond Brand 1" Fire-Shield Shaftliner XP (mold-resistant).
 - d. Pacific Coast Building Products, Inc; PABCORE Gypsum Shaftliner Board type X.
 - e. Temple-Inland Inc; SilentGuard Gypsum Shaftliner.
 - f. USG Corporation; Sheetrock Gypsum Liner Panels.
 - g. USG Corporation; Sheetrock Gypsum Liner Panels--Enhanced (mold-resistant).

2.04 ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3 -1/2 inch.
- B. Acoustical Shielding: Recycled ethylene vinyl acetate (EVA) sheet membrane; applied between studs and gypsum board.
 1. Sound Transmission Class (STC): Minimum of 25, calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
 2. Fire Resistance: Where fire rating is specified for the wall in which the acoustical shielding membrane is mounted, provide assemblies that have been tested in accordance with ASTM E119 for the same rating as the wall.
 3. Products:
 - a. Blue Ridge Fiberboard, a W.R. Meadows Company; Soundstop Sound-Abate: www.wrmeadows.com/#sle.
- C. Noiseproofing Compound:
 1. Viscoelastic dampening compound applied between sheets of gypsum wall board.
 2. Products:
 - a. Saint Gobain; Green Glue Noiseproofing Compound: www.greengluecompany.com.
- D. Acoustic Sealant: ASTM C 919; non-hardening, non-skinning, for use in conjunction with gypsum board. Or provide USG Acoustical Sealant manufactured by USG Corporation, or Pecora BA-98 Acoustical Sealant manufactured by Pecora Corporation. At exposed locations provide Tremco acrylic latex caulk or Sonneborn Sonolac.
- E. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
 1. Rigid Corner Beads: Low profile, for 90 degree outside corners and archways.
 2. Architectural Reveal Beads:
 3. Wall Mounted Deflection Beads: Flexible gasket and bead with 1-1/8 inch flange.
 4. Expansion Joints: V-shaped PVC with tear away fins.
- F. Acoustic Insulation: As specified in tested assemblies, or provide Thermafiber sound attenuating fire blanket, or similar.
- G. Trim: Provide manufacturer's standard metal trim accessories, of the beaded type with face flanges for concealment in joint compound except where semi-finishing or exposed type is indicated. Provide corner beads, L-type edge trim beads, U-type trim beads, special L-kerf-type edge trim beads, and one-piece control beads.
- H. Corner Beads: Galvanized steel.
- I. Edge Trim: Bead type(s) as detailed.
- J. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.

1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 2. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 3. Joint Tape: Perforated.
 4. Ready-mixed vinyl-based joint compound.
 5. Powder-type vinyl-based joint compound.
- K. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.
- L. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.
- M. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
- N. Adhesive for attachment to Wood or Masonry: ASTM C 557.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.
- B. Inspection List: Prior to gypsum board installation, verify the following:
1. Windows and doors are sealed to framing using caulks, foams, backer rod and/or similar.
 2. Window flashing is properly installed to shed water.
 3. All recessed lights beneath unconditioned spaces are air-tight and rated for insulated ceiling. All kitchen and bathroom fans are appropriately rated and exhausted to outside.
 4. Ductwork is sufficiently air-sealed.
 5. All vapor sealant, air sealant, and penetrations are completed as indicated on Drawings.

3.02 SHAFT WALL INSTALLATION

- A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
 2. Install studs at spacing required to meet performance requirements.
- B. Shaft Wall Liner: Cut panels to accurate dimension and install sequentially between special friction studs.
1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
 2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

3.03 FRAMING INSTALLATION

- A. Metal Framing: Comply with ASTM C 754 and manufacturer's instructions. Install metal furring channels in conjunction with rigid insulation where noted on plans. Provide stud sized accordingly with R-value where used in conjunction with insulation. Install channels maximum 24" o.c. Screw apply to masonry wall.
- B. Studs: Space studs as permitted by standard.
- C. Extend partition framing to structure in all locations.
1. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- E. Standard Wall Furring: Install at concrete and masonry walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
1. Orientation: Horizontal.

- a. Spacing: As indicated.
- F. Acoustic Furring: Install resilient channels at maximum 24 inches on center at wall framing. At floor/ceiling framing, install resilient channels at maximum 24" on center for framing on 16" on center and at maximum 16" on center for framing at 24" on center.
 - 1. Install resilient channel with the open side up.
 - 2. Install resilient channel perpendicular to wall framing.
 - 3. Locate joints over framing members.
 - 4. Resilient channel shall not touch adjoining walls or ceiling.
- G. Blocking: Install wood blocking for support of plumbing fixtures, toilet accessories and cabinets. Comply with Section 06 1000 - Rough Carpentry.
 - 1. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
 - a. Level ceiling system to a tolerance of 1/1200.
 - b. Laterally brace entire suspension system.
 - 2. Studs: Space studs as permitted by standard.
 - a. Extend partition framing to structure where indicated and to ceiling in other locations.
 - b. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
 - c. Wall Stud Bracing: For stud lengths greater than 12 feet not mechanically fastened to intersecting construction, install diagonal light gauge framing bracing (kickers) to structure above.
 - 3. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
 - 4. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.
 - a. Spacing: As indicated.
 - 5. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.05 BOARD INSTALLATION

- A. Comply with ASTM C 840 and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Isolate drywall work from abutting structural and masonry work. Position all ends and edges of all gypsum panels over framing members, except when joints are at right angles to framing members as in perpendicular application or when end joints are back-blocked. Use water resistant gypsum board at tub/shower surrounds at plumbing wall/chases. Omit vapor barrier at exterior walls behind water resistant gypsum board and provide weather resistant membrane.
- C. Apply gypsum panels first to the ceiling and then to the walls. Extend ceiling board into corners and make firm contact with top runner. To minimize end joints, use panels of maximum practical lengths. Fit ends and edges closely, but not forced together. Stagger end joints in successive courses with joints on opposite sides of a partition placed on different studs. Accurately locate openings for mechanical/electrical devices.
- D. Where wall type shown on drawings shows a specific fire or sound rating by UL or other testing agency. Contractor shall comply with specific construction details as shown in the tested assembly as described by the testing agency.
- E. Attach panels to framing supports by power-driven screws. Space fasteners not less than 3/8" from edges and ends of panels and drive as recommended for specific fastening method. Drive fasteners in field of panels first, working towards ends and edges. Hold panel in firm contact

with framing while driving fasteners. Drive fasteners heads slightly below surface of gypsum panels in a uniform dimple without breaking face paper. Avoid puncturing the vapor barrier during installation of wall board. Report any punctures or tears to General Contractor and repair as directed.

- F. Where installed over resilient channel, attach with 1" long screws for one layer 5/8" gypsum board, 1-5/8" long screws for two layers 5/8" gypsum board. Do not screw into the framing. A maximum of two layers of 5/8" gypsum board shall be installed on resilient channels.
- G. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- H. Cementitious Backing Board: Install over steel framing members where indicated, in accordance with ANSI A108.11-SystemDeleted and manufacturer's instructions.
- I. Install trim at all internal and external angles formed by the intersection of either panel surfaces or other surfaces. Apply corner bead to all vertical or horizontal external corners in accordance with manufacturer's directions.
- J. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board with sealant.
- K. Install trim at all internal and external angles formed by the intersection of either panel surfaces or other surfaces. Apply corner bead to all vertical or horizontal external corners in accordance with manufacturer's directions.

3.06 MISCELLANEOUS INSTALLATIONS

- A. Direct Bonding: Comply with manufacturer's recommendations where gypsum board is indicated to be directly bonded to substrate.
- B. Acoustical Sealant: Where work is indicated as "sound retarding" or shown with an STC rating, apply acoustical sealant as recommended by manufacturer. Install acoustic sealant at perimeter joints, behind control joints, around junction box/pipe/duct penetrations, and at the base of walls.
- C. Sound and Exterior Walls: Verify that fiberglass insulation and vapor barrier has been installed where shown, without gaps, and supported where necessary to prevent movement or dislocation before installing gypsum wall board.
- D. Wet Areas: Install moisture-resistant backing board where shown to receive thin-set tile and similar rigid applied finishes at tubs, showers and similar "wet" areas.
- E. Ceiling Soffits: Install system in accordance to manufacturer's instructions.

3.07 INSTALLATION OF TRIM AND ACCESSORIES

- A. Install trim at all internal and external angles formed by the intersection of either panel surfaces or other surfaces. Apply corner bead to all vertical or horizontal external corners in accordance with manufacturer's directions.
- B. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
- C. Corner Beads: Install at external corners, using longest practical lengths.
- D. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.08 JOINT TREATMENT

- A. Apply materials according to manufacturer's recommendations. Apply taping or all-purpose type compound to fastener depressions as the first coat. At areas to receive smooth finish, follow with a minimum of two additional coats of topping or all-purpose compound. Allow 24 hour minimum drying between coats. Sand lightly between coats. Leave all depressions level with the plane of the surface at wet areas. Treat joints fastener heads, cut edges and penetrations in water-resistant backing board using water-resistant joint compound to comply with water-resistant joint compound manufacturer's directions.
- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- C. Apply first coat to all bead trim and properly feather out from ground to plane of surface. Compound must be thoroughly dry and lightly sanded prior to application of second coat. Apply second and third coat in same manner as first coat, extending compound slightly beyond second coat and properly feathering from ground to plane or surface. Sand finish as necessary to provide a flat smooth surface ready for decoration. When sanding, take care not to roughen face paper. Finish surface shall provide a smooth and even surface ready for decoration.
- D. Apply first coat to all bead trim and properly feather out from ground to plane of surface. Compound must be thoroughly dry and lightly sanded prior to application of second coat. Apply second and third coat in same manner as first coat, extending compound slightly beyond second coat and properly feathering from ground to plane or surface. Sand finish as necessary to provide a flat smooth surface ready for decoration. When sanding, take care not to roughen face paper. Finish surface shall provide a smooth and even surface ready for decoration.

3.09 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.10 FIELD QUALITY CONTROL

- A. Assist testing lab in conducting field sound transmission tests of party wall assemblies. Correct any deficiencies noted.

3.11 CLEANING

- A. Remove temporary coverings used to protect adjacent work.
- B. Remove drywall and joint compound dust, spillage, splatter, etc. promptly from doors frames, windows and other adjoining work. Repair all surfaces which have been damaged by drywall work.

3.12 FINISH LEVEL SCHEDULE

- A. Walls and ceilings in mechanical and electrical rooms: Fire-taped.
- B. At Unit and Common Area walls: Smooth (Level 4 Finish).
- C. Soffits to be finished same as adjacent wall.
- D. Taping of gypsum board is to be to the following ASTM C 840 Levels:
 1. Level 0: Not used
 2. Level 1: Fire-taped; Tape in joint compound at joints and interior angles. Tool marks and ridges acceptable.
 3. Level 2: Utility areas and areas behind cabinetry; Tape compound at joints and interior angles plus separate coat of compound at joints, angles, fasteners, and accessories. Tool marks and ridges acceptable.
 4. Level 3: Walls scheduled to receive textured wall finish; Tape compound at joints and interior angles plus two separate coats of compound at joints, angles, fasteners, and accessories. Compound shall be smooth and free of tool marks and ridges.
 5. Level 4: Walls and ceilings scheduled to receive flat or eggshell paint finish; Tape compound at joints and interior angles plus three separate coats of compound at joints, angles, fasteners, and accessories. Compound shall be smooth and free of tool marks and ridges.
 6. Level 5: Walls and ceilings scheduled to receive semi-gloss or gloss paint finish; Tape compound at joints and interior angles plus three separate coats of compound at joints, angles, fasteners, and accessories. And a separate skim coat of compound over entire surface of gypsum board. Compound shall be smooth and free of tool marks and ridges.

END OF SECTION 09 2116

**SECTION 09 2300
GYPSUM PLASTERING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Gypsum plastering.
- B. Gypsum lath.

1.02 RELATED REQUIREMENTS

- A. Section 07 9005 - Joint Sealers: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- B. Section 09 2116 - Gypsum Board Assemblies: Metal stud framing and furring for plaster.
- C. Section 09 2613 - Gypsum Veneer Plastering.

1.03 REFERENCE STANDARDS

- A. ASTM C28/C28M - Standard Specification for Gypsum Plasters; 2010 (Reapproved 2015).
- B. ASTM C35 - Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster; 2001 (Reapproved 2014).
- C. ASTM C61/C61M - Standard Specification for Gypsum Keene's Cement; 2000 (Reapproved 2015).
- D. ASTM C206 - Standard Specification for Finishing Hydrated Lime; 2014.
- E. ASTM C631 - Standard Specification for Bonding Compounds for Interior Gypsum Plastering; 2009 (Reapproved 2014).
- F. ASTM C842 - Standard Specification for Application of Interior Gypsum Plaster; 2005 (Reapproved 2015).
- G. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide data on plaster materials, characteristics, and limitations of products specified.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum ten years documented experience.
- B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.06 MOCK-UP

- A. Construct mock-up of interior wall, 4 feet long by 4 feet wide, illustrating surface finish.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

1.07 FIELD CONDITIONS

- A. Do not apply plaster when substrate or ambient air temperature is under 50 degrees F or over 80 degrees F.
- B. Maintain minimum ambient temperature of 50 degrees F during and after installation of plaster.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gypsum Plaster:

1. National Gypsum Company: www.nationalgypsum.com/#sle.
2. USG: www.usg.com/#sle.
3. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 PLASTER MATERIALS

- A. Ready-Mixed Gypsum Plaster: ASTM C28/C28M; mill-mixed type, requiring only the addition of water.
- B. Lime: ASTM C206, Type S; special finishing hydrated lime.
- C. Aggregate for Base Coats: ASTM C35; sand and lightweight aggregates.
- D. Ready-Mixed Finishing Plaster: Gypsum/Lime putty type, ASTM C28/C28M; mixture of gauging plaster and lime.
- E. Ready-Mixed Finishing Plaster: Keene's cement/lime putty type; ASTM C61/C61M and ASTM C206.
- F. Ready-Mixed Finishing Plaster: Sand float type; ASTM C28/C28M and ASTM C35 prepared mixture of gypsum plaster and sand.
- G. Aggregate for Finish Coats: As specified in ASTM C842.
- H. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.
- I. Bonding Agent: ASTM C631. Type recommended for bonding plaster to monolithic concrete surfaces.

2.03 LATH AND ACCESSORIES

- A. Gypsum Lath: ASTM C1396/C1396M, perforated type.
 1. Thickness: 3/8 inch.
- B. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, maximum possible lengths.
 1. Material: Formed sheet steel with rust inhibitive primer, expanded metal flanges.
 2. Casing Beads: Square edges.
 3. Corner Beads: Radiused corners.
 4. Base Screeds: Bevelled edges.
- C. Corner Mesh: Formed sheet steel, minimum 0.018 inch thick, perforated flanges shaped to permit complete embedding in plaster, minimum 2 inch size; galvanized.
- D. Strip Mesh: Expanded metal lath, minimum 0.018 inch thick, 2 inch wide by 24 inch long; galvanized.
- E. Fasteners: Nails, staples, or other approved metal supports, of type and size to suit application, to rigidly secure accessories in place.
- F. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.

2.04 PLASTER MIXES

- A. Over Other Solid Bases: Two-coat application, ready-mixed plaster, mixed and proportioned in accordance with ASTM C842 and manufacturer's instructions.
- B. Ready-Mixed Plaster Materials: Mix in accordance with manufacturer's instructions.
- C. Finish Coat for Troweled Finish: Lime putty with gypsum gauging plaster, mixed and proportioned in accordance with ASTM C842.
- D. Finish Coat for Floated Finish: Lime putty with gypsum gauging plaster, mixed and proportioned in accordance with ASTM C842.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that existing conditions are satisfactory before starting work.

- B. Grounds and Blocking: Verify items within walls for other sections of work have been installed.
- C. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.
- D. Mechanical and Electrical: Verify services within walls have been tested and approved.

3.02 INSTALLATION - GYPSUM LATH AND ACCESSORIES

- A. Continuously reinforce internal angles with corner mesh, return 3 inches from corner to form the angle reinforcement; fasten at perimeter edges only.
- B. Place corner bead at external wall corners; fasten at outer edges of lath only.
- C. Place strip mesh diagonally at corners of lathed openings. Secure rigidly in place.
- D. Place 4 inch wide strips of strip mesh centered over junctions of dissimilar backing materials. Secure rigidly in place.
- E. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.
- F. Control Joints:
 - 1. Locate at 20 feet on center.
 - 2. Use preformed device to form joint.
- G. Coordinate work with installation of access panels.
- H. Place acoustic sealant at gypsum lath perimeter in accordance with manufacturer's instructions.
- I. At acoustical assemblies, provide resilient seal to penetrations, such as conduit, piping, outlet boxes, using acoustic sealant, rather than plastering tight to penetrations; with exception of where firestopping is provided.

3.03 PLASTERING

- A. Apply gypsum plaster in accordance with ASTM C842 and manufacturer's instructions.
- B. Finish Texture: Float to a consistent and smooth finish.

3.04 GYPSUM PLASTER REPAIR

- A. Hairline surface cracks
 - 1. Fill void using a putty or broad knife using commercially available spackling paste. Strike material off flush with the plaster surface.
 - 2. Sand lightly when dry if necessary, and then re-paint.
- B. Surface cracks larger than hairline up to credit card thickness.
 - 1. Use a setting type joint compound (USG Durabond or equal) using the same method as described above for hairline surface cracks.
- C. Larger cracks/ small holes
 - 1. Clean out loose plaster particles.
 - 2. Fill crack/ hole with setting type joint compound (USG Durabond or equal) with a broad knife, striking the material off flush with the surface. Allow to set.
 - 3. Reinforce filled in crack with drywall tape embedded in setting type joint compound. Feather edges out to smooth and begin to conceal the repair. Allow to set.
 - 4. Sand lightly to smooth and apply another thin coat of setting type joint compound. Allow to set. Repeat procedure as necessary to complete the repair.
- D. Small patches (less than 4 inches in diameter)
 - 1. Clean out loose plaster particles.
 - 2. Apply bonding agent (Larsen Plaster Weld or equal) to edges of existing plaster around the hole to be filled. Follow manufacturer's instructions for application.
 - 3. Old, dry wooden lath should be dampened with a water spray mist to limit suction and uneven drying of the plaster.

4. Fill void with milled plaster product (National Gypsum Gold Bond, USG Red Top or equal). Fill void full for smooth patch or leave slightly recessed as necessary to accommodate similar finish texture.
- E. Large patches
1. Scrape and remove any loose plaster or debris.
 2. Reinforce with expanded metal lath, cut slightly smaller than opening, fastened to framing, wood lath or other solid substrate.
 3. Apply bonding agent (Larsen's Plaster-Weld or equal) to edges of sound existing plaster.
 4. Re-plaster using three-coat technique as per ASTM C 842 using milled plaster product (National Gypsum Gold Bond, USG Red Top or equal).
- F. Re-surfacing plastered walls
1. Sand surface. Painted surfaces may require more preparation.
 2. Apply bonding agent (Larsen's Plaster-Weld or equal). Follow manufacturer's instructions for application.
 3. Fill any low spots with prepared veneer basecoat gypsum plaster product (USG Diamond, National Gypsum Kal-Kote or equal). Thickness should be no greater than 1/4" per layer. Scratch surface for key of next layer and allow to take-up sufficiently or dry.
 4. Parge entire wall area with veneer basecoat at approximately 1/16-3/32" thickness.
 5. Embed glass fiber mesh (EIFS type such as Dryvit, Sto or equal) into the fresh veneer plaster basecoat, scratching surface for subsequent finish coat. Allow to take-up sufficiently or dry
 6. Apply final finish veneer plaster (National Gypsum Kal-Kote, USG Imperial, Lime and Gauging).

END OF SECTION 09 2300

SECTION 09 2613
GYP SUM VENEER PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Gypsum veneer plaster on gypsum veneer base and existing plaster.
- B. Gypsum veneer base and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 07 8400 - Firestopping: Top-of-wall assemblies and through-wall penetrations at fire rated walls.
- B. Section 07 9005 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- C. Section 09 2116 - Gypsum Board Assemblies: Metal stud framing and furring for plaster.
- D. Section 09 2300 - Gypsum Plastering.

1.03 REFERENCE STANDARDS

- A. ASTM C587 - Standard Specification for Gypsum Veneer Plaster; 2004 (Reapproved 2014).
- B. ASTM C843 - Standard Specification for Application of Gypsum Veneer Plaster; 2017.
- C. ASTM C844 - Standard Specification for Application of Gypsum Base to Receive Gypsum Veneer Plaster; 2015.
- D. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.
- E. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- F. GA-216 - Application and Finishing of Gypsum Board; 2013.
- G. GA-600 - Fire Resistance Design Manual; 2015.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for submittal requirements and procedures.
- B. Product Data: Provide data on veneer plaster products.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum ten years of experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gypsum Veneer Plaster:
 - 1. Georgia-Pacific Gypsum LLC: www.gpgypsum.com/#sle.
 - 2. National Gypsum Company: www.nationalgypsum.com/#sle.
 - 3. USG: www.usg.com/#sle.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- B. Gypsum Veneer Plaster Base:
 - 1. Continental Building Products: www.continental-bp.com/#sle.
 - 2. Georgia-Pacific Gypsum LLC: www.gpgypsum.com/#sle.
 - 3. National Gypsum Company: www.nationalgypsum.com/#sle.
 - 4. USG: www.usg.com/#sle.
 - 5. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 GYPSUM VENEER PLASTER ASSEMBLIES

- A. Interior Partitions Indicated as Acoustic: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- B. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
 - 1. Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
 - 2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Shaft Walls at Elevator Shafts: Provide completed assemblies with the following characteristics:
 - 1. Air Pressure Within Shaft: Intermittent loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
 - 2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

2.03 MATERIALS

- A. Gypsum Veneer Plaster: ASTM C587, mixed in accordance with manufacturer's instructions.
- B. Standard Gypsum Veneer Base: ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 - 1. Thickness: 3/8 inch.
 - 2. Edges: Square.
- C. Fire-Rated Gypsum Veneer Base: ASTM C1396/C1396M, fire rated Type X; sizes to minimize joints in place; ends square cut.
 - 1. Thickness: 3/8 inch.
 - 2. Edges: Square.
- D. Gypsum Veneer Base Trim Accessories: Zinc-coated steel or plastic, complying with ASTM C1047.
- E. Gypsum Board Accessories: Complying with ASTM C1047, GA-216, GA-600, and _____.
- F. Joint Reinforcing for Gypsum Veneer Base: As specified in ASTM C587.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrates are ready to receive work.
- B. Verify gypsum board substrate is flat, joints are taped and sanded, and surface is ready to receive work of this Section. Verify joint and surface perimeter accessories are in place.
- C. Verify gypsum plaster base is flat, smooth and surface is ready to receive work. Verify joint and surface perimeter accessories are in place.

3.02 PREPARATION

- A. Clean surfaces of dust or loose matter.
- B. Remove projections greater than 1/8 inch and fill depressions greater than 1/4 inch with Portland cement mortar.

3.03 INSTALLATION - GYPSUM PLASTER BASE

- A. Install gypsum base in accordance with ASTM C844.
- B. Use drywall screws to fasten gypsum base to framing substrate.
- C. Install accessories.
- D. Tape, fill, and sand filled joints, edges, corners, openings, and trim to produce surface ready to receive veneer finish.

E. Feather coats onto adjoining surfaces so that joint camber is maximum 1/32 inch.

3.04 INSTALLATION - VENEER PLASTER

A. Install gypsum veneer plaster in accordance with ASTM C843 and manufacturer's instructions.

B. Two Coat Applications.

1. Apply base coat to a thickness of 1/8 inches
2. Apply final coat over slightly green, almost dry base coat, to a thickness of 1/16 inch.
3. Total Thickness: 3/16 inch.

C. Finish surface to flat, smooth, hard trowel finish.

3.05 PROTECTION

A. Do not permit traffic near unprotected finished surfaces.

END OF SECTION 09 2613

SECTION 09 3000

TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Ceramic accessories.
- C. Ceramic trim.
- D. Non-ceramic trim.

1.02 REFERENCE STANDARDS

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2017.
- B. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2014.
- C. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
- D. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2010).
- E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).
- F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
- G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).
- H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).
- I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).
- J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).
- K. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
- L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2010).
- M. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2010 (Reaffirmed 2016).
- N. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014.
- O. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2012.
- P. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2012.
- Q. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018.

R. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2017.

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

1.04 QUALITY ASSURANCE

- A. Maintain one copy of and ANSI A108/A118/A136 and TCNA (HB) on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- C. Installer Qualifications:
 - 1. Company specializing in performing tile installation, with minimum of five years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.06 FIELD CONDITIONS

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

- A. Manufacturers:
 - 1. American Olean Corporation: www.americanolean.com/#sle.
 - 2. Dal-Tile Corporation: www.daltile.com/#sle.
- B. Ceramic Glazed Floor Tile, Type CT1: ANSI A137.1, standard grade.
 - 1. Moisture Absorption: 3.0 to 7.0 percent as tested in accordance with ASTM C373.
 - 2. Size: 4 1/4 x 4 1/4 inch, nominal.
 - 3. Shape: Square.
 - 4. Edges: Cushioned.
 - 5. Surface Finish: Matte glazed.
 - 6. Color(s): To be selected by Architect from manufacturer's standard range.
 - 7. Trim Units: Matching cove and surface bullnose shapes in sizes coordinated with field tile.

2.02 TRIM AND ACCESSORIES

- A. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.
- B. Ceramic Trim: Matching surface bullnose and cove base ceramic shapes in sizes coordinated with field tile.
 - 1. Applications:
 - a. Open Edges: Bullnose.
 - b. Inside Corners: Jointed.
 - c. Floor to Wall Joints: Cove base.
 - 2. Manufacturers: Same as for tile.
- C. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
 - 1. Applications:
 - a. Transition between floor finishes of different heights.
 - b. Borders and other trim as indicated on drawings.
 - 2. Manufacturers:

- a. Schluter-Systems: www.schluter.com/#sle.

2.03 SETTING MATERIALS

- A. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
 - 1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.

2.04 GROUTS

- A. High Performance Polymer Modified Grout: ANSI A118.7 polymer modified cement grout.
 - 1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
 - 2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
 - 3. Color(s): As selected by Architect from manufacturer's full line.

2.05 MAINTENANCE MATERIALS

- A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
 - 1. Applications: Between tile and plumbing fixtures.
 - 2. Color(s): As selected by Architect from manufacturer's full line.
- B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
 - 1. Composition: Water-based colorless silicone.

2.06 ACCESSORY MATERIALS

- A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
 - 1. Crack Resistance: No failure at 1/16 inch gap, minimum.
 - 2. Fluid or Trowel Applied Type:
 - a. Material: Synthetic rubber or Acrylic.
 - b. Thickness: 20 mils, maximum.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
 - 1. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.03 INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Provide layout with 1/8" wide joints.
- D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- F. Form internal angles square and external angles bullnosed.
- G. Install ceramic accessories rigidly in prepared openings.
- H. Install non-ceramic trim in accordance with manufacturer's instructions.
- I. Sound tile after setting. Replace hollow sounding units.
- J. Keep control and expansion joints free of mortar, grout, and adhesive.
- K. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- L. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.
- M. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.
- N. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
 - 1. Use uncoupling membrane under all tile unless other underlayment is indicated.
- B. Over self-leveling underlayment on concrete, install similar to TCA Handbook Method F122. with anti-fracture membrane and latex-portland cement bond coat and standard mortar. Verify that all materials are compatible with self-leveling underlayment prior to installation.

3.05 INSTALLATION - FLOORS - MORTAR BED METHODS

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F111, with cleavage membrane, unless otherwise indicated.
- B. Cleavage Membrane: Lap edges and ends.
- C. Mortar Bed Thickness: 5/8 inch, unless otherwise indicated.

3.06 CLEANING

- A. Clean tile and grout surfaces.

3.07 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION 09 3000

**SECTION 09 6500
RESILIENT FLOORING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient sheet flooring.
- B. Resilient base.
- C. Resilient rubber tile flooring.
- D. Installation accessories.

1.02 RELATED SECTIONS

- A. Section 01 2300 - Alternates.
- B. Section 03 5400 - Self-Leveling Underlayment.

1.03 ALTERNATES

- A. Refer to Section 01 2300 - Alternates for product alternatives affecting this Section.
- B. **Alternate 2:** Provide and install vinyl composition floor tile in lieu of gypsum underlayment wear layer.

1.04 REFERENCE STANDARDS

- A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2014c.
- B. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
- C. ASTM F1344 - Standard Specification for Rubber Floor Tile; 2015.
- D. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012).
- E. ASTM F1913 - Standard Specification for Vinyl Sheet Floor Covering Without Backing; 2004 (Reapproved 2014).
- F. ASTM F2034 - Standard Specification for Sheet Linoleum Floor Covering; 2008 (Reapproved 2013).
- G. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products; www.baaqmd.gov; 2002.
- H. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2015.
- I. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Indicate seaming plan for each unit type.
- D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection for each type of flooring material.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 7700 - Closeout Procedures, for additional provisions.
 - 2. Extra Flooring Material: Quantity equivalent to 2 percent of each type and color.

3. Extra Wall Base: Quantity equivalent to 2 percent of each type and color.
4. Extra Stair Materials: Quantity equivalent to 2 percent of each type and color.

PART 2 PRODUCTS

2.01 SHEET FLOORING

- A. Linoleum Sheet Flooring: Homogeneous wear layer bonded to backing, with color and pattern through wear layer thickness:
 1. Minimum Requirements: Comply with ASTM F2034, Type corresponding to type specified.
 2. Backing: Jute fabric.
 3. Thickness: 0.100 inch, minimum, excluding backing.
 4. Pattern: Solid color.
 5. Manufacturers:
 - a. Forbo Linoleum, Inc; Product Marmoleum: www.forbo-industries.com.
 - b.

2.02 TILE FLOORING

- A. Alternate Bid Item: Vinyl Composition Tile (VCT.1): Homogeneous, with color extending throughout thickness, and:
 1. Manufacturers:
 - a. Armstrong World Industries, Inc: www.armstrong.com.
 - b. Johnsonite, a Tarkett Company: www.johnsonite.com.
 - c. Mannington Mills, Inc: www.mannington.com.
 - d. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
 2. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
 3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.
 4. Size: 12 by 12 inch.
 5. Thickness: 0.125 inch.
 6. Color: To be selected by Architect from manufacturer's full range.
- B. Rubber Tile (RT): Homogeneous color and pattern throughout thickness, and:
 1. Manufacturers:
 - a. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
 - b. Roppe: www.roppe.com
 2. Minimum Requirements: Comply with ASTM F1344, of Class corresponding to type specified.
 3. Size: 12 x 12 inch.
 4. Overall Thickness: 0.375 inch.
 5. Color: To be selected by Architect from Manufacturer's standards.
 6. Texture: Hammered.
 7. Color: To be selected by Architect from manufacturer's full range.
 8. Manufacturer:
 - a. Roppe; Product Designer's Choice: www.roppe.com.
 - b. Substitutions: See Section 01 6000 - Material and Equipment.

2.03 RESILIENT BASE

- A. Resilient Base (RB.1, RB.2 and RB.3): ASTM F 1861, Type TP, rubber, thermoplastic; top set Style B, Cove, contoured wallbase and as follows:
 1. Manufacturers:
 - a. Johnsonite, a Tarkett Company: www.johnsonite.com.
 - b. Roppe Corp: www.roppe.com.
 - c. Products: See Materials Finish List and Finish Schedule on Drawings for styles, size, colors and locations.
 - d. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

- B. Resilient Tub Molding:
 - 1. Johnsonite, a Tarkett Company; Product TM-50A: www.johnsite.com.
 - 2. Color: White.
 - 3. Finish: Smooth luster.
 - 4. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.04 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
- C. All adhesive products must be "Green Label" tested and certified.
 - 1. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.
- D. Moldings, Transition and Edge Strips: Metal.
 - 1. Manufacturers:
 - a. Schluter Systems: www.schluter.com.
 - 1) Products and Locations: See Finish Schedule.
 - b. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive resilient flooring.
- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.
- C. Verify that concrete sub-floor surfaces are dry enough and ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Coordinate with Section 06 2000 - Finish Carpentry for the installation of underlayment immediately prior to installing the resilient flooring.
- B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- C. Prohibit traffic until filler is cured.
- D. Clean substrate.
- E. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints tightly.
- E. Set flooring in place, press with heavy roller to attain full adhesion.
- F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.

- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- I. Maintain room temperature per manufacturer's recommendations.

3.04 SHEET FLOORING

- A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns carefully at seams. Roll seams and match patterns.
- B. Double cut sheet at seams.
- C. Lay flooring with tightly butted seams, without any seam sealer unless otherwise indicated.
- D. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.
- E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Before installation of flooring, secure metal strips with stainless steel screws. Secure resilient strips by adhesive.
- F. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.05 TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
- B. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.
- C. Install tile to indicated pattern. Allow minimum 1/2 full size tile width at room or area perimeter.
- D. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. After installation of flooring, secure metal strips with stainless steel screws. Secure resilient strips with adhesive.

3.06 INSTALLATION - BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Install filler to provide a smooth installation surface where installed over coved sheet vinyl flooring as indicated on drawings. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.07 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's instructions.
- C. Clean sheet flooring in accordance with manufacturer's instructions.

3.08 PROTECTION

- A. Prohibit traffic on resilient flooring for 48-hours after installation.

END OF SECTION 09 6500

SECTION 09 6623
RESINOUS MATRIX TERRAZZO FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Epoxy matrix terrazzo with ground and polished finish.
- B. Terazzo repair.

1.02 REFERENCE STANDARDS

- A. NTMA (GRAD) - Aggregate Gradation Standards; Current Edition.
- B. NTMA (EPOXY) - Epoxy Terrazzo Specifications; Current Edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Samples: Submit two samples, ___ inch by ___ inch in size illustrating color, chip size and variation, chip gradation, matrix color, and typical divider strip.
- C. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with NTMA recommendations as posted at their web site at www.ntma.com.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
 - 1. Minimum five years of documented experience.
 - 2. Associate member firm of the National Terrazzo and Mosaic Association, Inc.
- C. Installer Qualifications: Company specializing in performing the type of work specified in this section.
 - 1. Minimum five years of documented experience.
 - 2. Contractor member of the National Terrazzo and Mosaic Association, Inc.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store terrazzo materials in a dry, secure area.
- B. Maintain minimum temperature of 60 degrees F.
- C. Keep products away from fire or open flame.

1.06 FIELD CONDITIONS

- A. Do not install terrazzo when temperature is below 50 degrees F or above 90 degrees F.
- B. Maintain temperature within specified range 24 hours before, during, and 72 hours after installation of flooring.
- C. Provide ambient lighting level of 50 ft candles, measured at floor surface.

PART 2 PRODUCTS

2.01 EPOXY MATRIX TERRAZZO APPLICATIONS

- A. Floors:
 - 1. Thickness: 3/8 inch, nominal.
 - 2. Aggregate Type: Match existing.
 - 3. Aggregate Size: Match existing.

2.02 MATERIALS

- A. Epoxy Matrix Terrazzo: Aggregate and matrix mix applied to substrate, troweled flat, and ground smooth.
 - 1. Mix Proportions: As required to achieve appearance specified.

- B. Matrix: Two component resin and epoxy hardener with mineral filler and color pigment, non-volatile, thermo-setting.
- C. Aggregate: Type as indicated; sized in accordance with NTMA aggregate gradation standards; color(s) as indicated, uniform in color.
- D. Finishing Grout: Epoxy, color to match terrazzo matrix.

2.03 ACCESSORIES

- A. Sealer: Colorless, non-yellowing, penetrating liquid type to completely seal matrix surface; not detrimental to terrazzo components.
- B. Primer: _____.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.

3.02 PREPARATION

- A. Clean substrate of foreign matter.
- B. Prepare concrete subfloor by mechanically abrading surface in accordance with manufacturer's instructions.
- C. Apply primer in accordance with manufacturer's instructions.

3.03 INSTALLATION

- A. Place terrazzo mix over substrate to thickness indicated.

3.04 FINISHING

- A. Finish terrazzo to NTMA requirements.
- B. Produce terrazzo finish surface to match existing, with 70 percent chip exposed.
- C. Grind terrazzo surfaces with power disc machine; sequence with coarse to fine grit abrasive, using a wet method or using a dry grinder with vacuum to control dust.
- D. Apply grout to fill voids exposed from grinding.
- E. Remove grout coat by grinding, using a fine grit abrasive.

3.05 CLEANING

- A. Scrub and clean terrazzo surfaces with neutral pH cleaner in accordance with manufacturer's instructions. Let dry.
- B. Immediately after terrazzo has dried, apply sealer in accordance with manufacturer's instructions.
- C. Polish surfaces in accordance with manufacturer's instructions.

END OF SECTION 09 6623

SECTION 09 7700
FIBERGLASS REINFORCED PANELS (FRP)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Prefinished polyester glass reinforced plastic sheets.
- B. Base and Molding.
- C. Accessories.

1.02 RELATED SECTIONS

- A. Section 09 2116 - Gypsum Board Assemblies.

1.03 REFERENCES

- A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2010.
- B. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (reapproved 2010).
- C. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.
- D. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.
- E. ASTM D2583 - Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor; 2013.
- F. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2017.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2017.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Selection Samples: Submit manufacturer's standard color pattern selection samples representing manufacturer's full range of available colors and patterns.
- C. E. Manufacturers Material Safety Data Sheets (MSDS) for adhesives, sealants and other pertinent materials prior to their delivery to the site.

1.05 QUALITY ASSURANCE

- A. Panels, trims, moldings, base, fasteners and adhesives provided by the same manufacturer.

1.06 DELIVERY AND STORAGE OF MATERIALS

- A. Materials are to be factory packaged on strong pallets.
- B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (range of 60 to 75°F) for 48 hours prior to installation.

1.07 ENVIRONMENTAL CONDITIONS

- A. Building should be fully enclosed prior to installation with sufficient heat (70°) and ventilation consistent with good working conditions for finish work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Marlite, www.marlite.com.
- B. See Section 01 2513 - Product and Substitution Procedures.

2.02 PANELS

- A. Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319.

1. Coating: Multi-layer print, primer and finish coats or applied over-layer.
2. Dimensions.
 - a. Wall Panels: 0.090 inch thick by 4 foot wide panels in 8 foot or 10 foot lengths. Choose panel sizes to minimize horizontal seams. No seams are allowed for finish heights less than or equal to 8 feet.
 - b. Front Finish: Pebble.
 - c. Front Finish: Smooth.
 - d. Back Surface: Smooth.
 - 1) Minor imperfections which do not affect functional properties are acceptable.
 - e. Color: To be selected from manufacturers complete range of standard colors.
- B. Properties: Resistant to rot, corrosion, staining, denting, peeling, and splintering.
 1. Flexural Strength - 1.0 x 104 psi per ASTM D790.
 2. Flexural Modulus - 3.1 x 105 psi per ASTM D790.
 3. Tensile Strength - 7.0 x 103 psi per ASTM D638.
 4. Tensile Modulus - 1.6 x 105 psi per ASTM D638.
 5. Water Absorption - 0.72% per ASTM D570.
 6. Barcol Hardness (scratch resistance) of 35 55 as per ASTM D2583.
 7. Izod Impact Strength of 72 ft. lbs./in ASTM D256.

2.03 BASE AND MOLDINGS

- A. PVC Base Molding shall be a Rigid extruded PVC with integral color .
 1. Base Profiles for 0.090 inch thick panels
 - a. M 612 FRP Base Molding
 - b. M 651 Inside Corner
 - c. M 660 Outside Corner
 - d. M 620 LH End Cap
 - e. M 625 RH End Cap
 2. Color: To be selected from manufacturers complete range of standard colors.
- B. PVC trim specified shall be extruded rigid or semi-rigid PVC with integral color in 8 or 10 foot lengths.
 1. PVC Trim: Thin-wall semi-rigid extruded PVC. Profiles for 0.090 inch thick panels.
 - a. M 350 Inside Corner.
 - b. M 360 Outside Corner.
 - c. M 365 Division.
 - d. M 370 Edge.
 - e. V 177 135° Inside Corner (available in white only).
 - f. V 179 135° Outside Corner (available in white only).
 - g. Color: To be selected from manufacturers complete range of standard colors.

2.04 ACCESSORIES

- A. Fasteners: Non-staining nylon drive rivets, of length to suit project conditions and color to match panels.
- B. Adhesives: As recommended and provided by panel manufacturer complying with ASTM C 557.
- C. Sealants: As recommended and provided by panel manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.

3.02 PREPARATION

- A. Apply panels over a smooth , solid, flat, clean subwall.

3.03 CONDITIONING

- A. Panels shall be opened and allowed to acclimate for 48 hours prior to installation. Room temperature shall be approximately 70° F.

3.04 INSTALLATION

- A. Install all panels in strict accordance with manufacturer's installation instructions.
- B. All moldings shall provide for a minimum 1/8 inch expansion joint to insure proper installation.
- C. Install panels with low-VOC adhesive and sealant as recommended by manufacturer.

3.05 CLEANING

- A. Clean surface after completion of building construction.

3.06 PROTECTION

- A. Protect installed panels from subsequent construction operations.

3.07 MAINTENANCE

- A. Wipe down using a damp cloth and mild soap solution or cleaner.
- B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION 09 7700

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

1.02 RELATED SECTIONS

- A. Section 05 5000 - Metal Fabrications: Shop-primed items.
- B. Section 08 1113 - Hollow Metal Doors and Frames.
- C. Section 09 2116 - Gypsum Board Assemblies.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- D. GreenSeal GS-11 - Paints and Coatings; 2013.

1.04 DEFINITIONS

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.
 - 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
 - 3. Allow 30 days for approval process, after receipt of complete samples by Architect.
 - 4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.
- C. Samples: Samples of stained finishes and natural finishes on sample of actual wood or other substrate (such as Hardi siding) to be painted after preliminary color selection but before final painting begins.
- D. Painter shall expect to submit up to three samples of interior colors and up to six samples of exterior colors.
- E. Product Data: Provide data on specified products, describing physical performance characteristics; including patterns, colors available and compliance with regulatory requirements.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Paint and Coatings: 1 gallon of each color; store where directed.
 - 2. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience.

1.07 REGULATORY REQUIREMENTS

- A. Flame spread ratings shall be in accordance to H.U.D. MPS 405-8.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
- B. Paints, Stains, Sealers and Fillers:
 - 1. Basis of Design: The Sherwin-Williams Company; www.sherwin-williams.com.
 - 2. Other approved manufacturers:
 - a. Benjamin Moore & Co: www.benjaminmoore.com/#sle.
 - b. PPG Paints: www.ppgpaints.com/#sle.
 - c. Valspar Corporation: valsparpaint.com.
 - d. Diamond Vogel: www.diamondvogel.com.
 - 3. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
 - 1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 2. Supply each coating material in quantity required to complete entire project's work from a single production run.
 - 3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.
- B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- C. Volatile Organic Compound (VOC) Content:
 - 1. All interior paints and primers must comply with current Green Seal Standards for low VOC limits. The calculation of VOC shall exclude water and colorants added at the point-of-sale.

| PRODUCT TYPE | VOC LEVEL (in g/L) |
|------------------|--------------------|
| Flat Topcoat | 50 |
| Non-Flat Topcoat | 50 |

| | |
|------------------------|-----|
| Primer or Undercoat | 100 |
| Floor Paint | 50 |
| Anti-Corrosive Coating | 100 |
| Stains | 250 |

2.03 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 1. Gypsum Wallboard: 12 percent.
 2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
 4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to coating application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- G. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
- I. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
- J. Interior Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer

has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

- K. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior caulking compound after prime coat has been applied. Back prime concealed surfaces before installation.
- L. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.
- M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.
- D. Sand wood and metal surfaces lightly between coats to achieve required finish.
- E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- F. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- H. Application shall be by brush, roller or spray according to manufacturer's instructions. If spray application is used the surface must be back rolled.
- I. Touch-ups: Where due to the type of surface and/or type of paint, touch-up is visible, repaint the entire surface (i.e. gypsum board, wall-to-wall).
- J. Supply suitable primer to jobsite for use by siding installers (all cut ends of siding to be primed).

3.04 SCHEDULE - SURFACES TO BE FINISHED

- A. The following is an outline of items to be finished. The outline is general and is not intended as a complete schedule.
 - 1. Painting of exterior wood trim including any non-clad trim, soffits, fascia, and miscellaneous exterior wood. Exterior trim to be brushed not sprayed. All trim to be back-primed prior to installation.
 - 2. Painting all exterior metal without a factory finish including metal doors, metal door frames, stairs, metal railings, corner protection angles, mechanical equipment, electrical equipment, meter housings and, etc.
 - 3. Staining and varnishing of interior wood that is not prefinished or indicated to be painted including doors and frames, handrails, cut end of prefinished woodwork, field cut edges of interior doors, miscellaneous interior hardwood trim, etc.
 - 4. Painting of all interior, non-prefinished wood.
 - 5. Painting of all gypsum board where scheduled.
 - 6. Painting of all mechanical and electrical work exposed in finished rooms including ceiling and wall grilles, and surfaces of electrical cabinets.
 - 7. Painting all interior ferrous metal without factory finish including metal walls, metal ceilings, metal doors, metal door frames, stairs, metal railings, corner protection angles, mechanical equipment, electrical equipment, and, etc.
 - 8. Painting of flashing exposed in the finish work except for flashing having a painted factory finish.
 - 9. Labeling of all storm drains or storm inlets with a painted stencil that reads, "Caution - Leads to lakes!"
- B. Paint the surfaces described below under Schedule - Paint Systems.

1. Exterior Wood (trim, moldings, panels, etc.):
 - a. 1 coat A-100 Exterior Oil Wood Primer.
 - b. 2 coats SuperPaint Exterior Latex Satin.
2. Exterior Metal (verify metal type):
 - a. 1 coat Pro Industrial Pro-Cryl Universal Primer.
 - b. 1 coat Direct-to-Metal Enamel (provide 2 coats at metal doors).
3. Fiber Cement Board (pre-primed siding and trim):
 - a. 1 coat Loxon Exterior Acrylic Masonry Primer (prime field-cut exposed surfaces).
 - b. 2 coats Duration Coating Exterior Latex Satin.
 - c. 3 colors, 2 siding colors and 1 contrasting trim color.
4. Pavement Markings:
 - a. 1 coat Pro-Park Waterborne Traffic Marking Paint.
5. Interior Concrete Masonry Units (where epoxy paint is scheduled):
 - a. 1 coat Loxon Concrete & Masonry Primer.
 - b. 1 coat Pro Industrial Pre-Catalyzed Water Based Epoxy.
6. Interior Metal - Painted (verify metal type):
 - a. 1 coat Pro Industrial Pro-Cryl Universal Primer.
 - b. 1 coat Industrial Enamel 100.
7. Metal Mechanical/Electrical Equipment at finished spaces and ceilings of Custodial Closets:
 - a. 1 coat Pro Industrial Pro-Cryl Universal Primer.
 - b. 1 coat Industrial Enamel 100.
8. Interior Gypsum Board (all bath walls and ceilings):
 - a. 1 coat ProGreen 200 Interior Latex Wall Primer.
 - b. 2 coats ProGreen 200 Interior Latex Semi-gloss.
9. Interior Gypsum Board (all other areas):
 - a. 1 coat ProGreen 200 Interior Latex Wall Primer.
 - b. 2 coats ProGreen 200 Interior Latex Eg-Shel.
 - c. All ceilings to be Ceiling White.
 - d. All units to be Builder White.
 - e. All common rooms and halls to be color selected by Architect.
10. Interior wood:
 - a. 1 coat Wood Classics FastDry Sanding Sealer.
 - b. 1 coat Wood Classics 250 VOC Interior Oil Stain.
 - c. 1 coat Wood Classics FastDry Varnish Hand Rubbed Satin.
11. Interior concrete:
 - a. Rough masonry primer: B28W0025 - PrepRite Block Filler White.
 - b. 2 coats A97W00151 - Duration Home Interior Latex Satin Extra White

END OF SECTION 09 9000

**SECTION 10 1410
EXTERIOR SIGNAGE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Address Signs.
- B. Traffic Signs.
- C. Building Identification Signs.
- D. Directional Signs.

1.02 RELATED SECTIONS

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide manufacturer's product data for each type of sign.
- C. Samples: Submit two samples of each sign form and material showing finishes, colors, surface textures and qualities of manufacturer.
- D. Manufacturer's Instructions: Indicate installation requirements.

PART 2 PRODUCTS

2.01 BUILDING ADDRESS NUMBERS AND LETTERS

- A. Cast Metal Letters:
 - 1. Provide aluminum, brushed, size as indicated on drawings, by Gemini signs or equal; www.geminisignletters.com. Letter style as selected by the Architect from the manufacturer's standard selections.
 - a. Building Address Numbers: West entry and at south retaining wall. Address at south retaining wall shall include street name.

2.02 TRAFFIC SIGNS

- A. Signs shall be manufactured from 16 gage steel and shall be 12" x 18". Signs shall have standard traffic symbols as indicated. At exterior locations, mount sign on U-channel steel post. Posts shall be 10' long with 5' above ground.
- B. Provide the following signs and quantities:
 - 1. Accessible Parking (1).
 - 2. No Parking (1)
 - 3. Stop Sign (1).

2.03 DIRECTIONAL SIGNAGE

- A. Sign shall be manufactured from 16 gage steel and shall be 12" x 12". Sign shall have standard wheelchair symbol above the word 'ACCESS'. An arrow shall be below the lettering pointing in the direction of the accessible entrance. Mount sign to building using anchoring devices suitable to wall cladding material.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install address signs using screws matching color of sign supplied by manufacturer. Install traffic signs on posts driven to frost depth.

END OF SECTION 10 1410

SECTION 10 1421
INTERIOR SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Interior signage of the following types:
 - 1. ADA compliant interior signage, custom construction.

1.02 REFERENCES

- A. ANSI/ICC A117.1 - Accessible and Useable Buildings and Facilities; 1998.
- B. ATBCB ADAAG - Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG); U.S. Architectural Transportation Barriers Compliance Board; 2004.

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for requirements for submittal procedures.
- B. Product Data: Manufacturer's descriptive literature.
- C. Shop Drawings: List sign styles, lettering, locations and dimensions of each interior sign.
- D. Selection Samples: One complete set of color chips representing manufacturer's full range of available colors.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with requirements of ANSI/ICC A117.1 and ADAAG.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Designer Sign Systems; www.designersign.com.
 - 2. Take Form; www.takeform.net.
 - 3. ASI; www.asimodulex.com.
 - 4. Serigraphics Sign Systems; www.serigraphicssign.com.
 - 5. GSI; www.signsbygisi.com.
 - 6. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 INTERIOR SIGNAGE SYSTEM

- A. Signs shall be 1/16" thick matte finish plastic with 1/4" radius corners. Signs shall have tactile 1/32" raised text and symbols such that the text and sign surface are contrasting colors and ADA-compliant including Grade 2 Braille. Typeface of text shall be CG Triumvirate Bold, text shall be all upper case, symbols and numbers as indicated below. Color for signs and typeface shall be selected from manufacturer's standard colors by the Architect. Signs shall be adhesive mounted.

2.03 ROOM IDENTIFICATION SIGNS

- A. Signs shall be 4" x 10", sign type as described under interior signage system above. Provide the following signs with 1" text indicated below and the quantities indicated in the parenthesis following the text. Organize text on two rows where necessary to minimize sign length.
 - 1. "IN CASE OF FIRE DO NOT USE ELEVATOR " (provide one for each floor, install at each elevator lobby).
 - 2. Basement Level
 - a. "STORAGE" - ST9 (3)
 - b. "ELECTRICAL" - ST9/ST9A (1)
 - c. "WATER" - ST9 (1)
 - d. **"EXIT" -ST9 (3)**
 - e. "LAUNDRY" - ST9 (1)
 - f. "TENANT STORAGE" - ST9 (4)

- g. "TRASH/RECYCLING" - ST9 (1)
- 3. First Level
 - a. "STORAGE" - ST9 (1)
 - b. "TOILET" - ST8 (1)
- 4. Second Level
 - a. "ELECTRICAL" - ST9 (1)
 - b. "JANITOR" ST9 (1)
- 5. Third Level
 - a. "ELECTRICAL" - ST9 (1)
 - b. "JANITOR" ST9 (1)
- 6. Fourth Level
 - a. "STORAGE" - ST9 (1)
 - b. "JANITOR" ST9 (1)
- 7. Fifth Level
 - a. "STORAGE" - ST9 (1)
 - b. "MECHANICAL" - ST9 (2)

2.04 APARTMENT IDENTIFICATION SIGNS

- A. Provide one sign, 4" x 4", with three 1-1/2" numbers for each apartment. Sign type as described under interior signage system above. Coordinate numbering of signs with Owner and Architect prior to fabrication.

2.05 STAIR ID SIGNAGE

- A. Sign type as described under interior signage system above.
- B. Interior Stairwells: Provide 12" x 12" signage with text conforming to Life Safety Code 7.2.2.5.4 indicating floor level, terminus of top and bottom of enclosure, identification of enclosure, floor level of and direction to exit discharge. Locate inside enclosure 60" above floor landing in a visible position.
- C. Level ID: Provide 5" x 5" signage with text indicating floor level. Locate inside enclosure 60" above floor landing in a visible position.

2.06 ELEVATOR SIGNAGE

- A. Provide 8" x 5" signage with text to read "In case of fire elevators are out of service, use exit" with fire safety graphic at each elevator opening. Sign type as described under interior signage system above.
- B. "FLOOR #" (# shall be equal to floor number, provide one for each floor at each elevator, install at each elevator lobby).

2.07 HANDICAP ACCESS DECAL

- A. Provide one decal to be mounted on glass at the west entrance with International Symbol of Accessibility.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine installation areas to ensure that conditions are suitable for installation.
- B. Examine signage for defects prior to installation. Do not install damaged signage.

3.02 PREPARATION

- A. Verify mounting heights and locations for interior signage will comply with referenced standards.
- B. Clean mounting locations of dirt, dust, grease or similar conditions that would prevent proper installation.

3.03 INSTALLATION

- A. Install signs level, plumb, without distortion, and in proper relationship with adjacent surfaces using manufacturer's recommended standard mounting system.

1. Mounting: Mount with acrylic VHB double sided tape.
- B. Remove adhesive from exposed sign surfaces as recommended by manufacturer.
- C. Clean signs after installation as recommended by manufacturer.
- D. Replace damaged products before Substantial Completion.

END OF SECTION 10 1421

SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Accessories for residential bathrooms and public restrooms.

1.02 RELATED SECTIONS

- A. Section 06 1000 - Rough Carpentry for placement of concealed anchor devices.
- B. Section 06 2000 - Finish Carpentry: for installation of accessories.
- C. Section 08 8313 - Mirrored Glass.

1.03 REFERENCE STANDARDS

- A. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement to receive anchor attachments.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
- C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

1.06 COORDINATION

- A. Coordinate the work with the placement of internal wall reinforcement to receive anchor attachments.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Gamco; www.gamcousa.com
 - 2. American Specialties, Inc: www.americanspecialties.com
 - 3. Bobrick Washroom Equipment, Inc: www.bobrick.com
 - 4. Basco: www.bascoinc.com.
 - 5. Bradley Corporation: www.bradleycorp.com
 - 6. Moen: www.moen.com.
 - 7. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- B. All items of each type to be made by the same manufacturer.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Stainless Steel Sheet: ASTM A666, Type 304.

- C. Stainless Steel Tubing: ASTM A269, Type 304 or 316.
- D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- E. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.
- F. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.

2.04 FABRICATION

- A. Weld and grind smooth joints of fabricated components.
- B. Form exposed surfaces from single sheet of stock, free of joints.
- C. Back paint components where contact with building finishes will cause electrolysis.
- D. Shop assemble components and package complete with anchors and fittings.
- E. Provide steel anchor plates, adapters, and anchor components for installation.
- F. Hot-dip galvanize exposed and painted ferrous metal and fastening devices.
- G. Provide steel anchor plates and anchor components for installation building finishes.
- H. Stamped names or labels on exposed faces of toilet and bath accessory units are not permitted, however unobtrusive labels indicating manufacturer and model number are required on surface not exposed to view.
- I. Surface mounted accessories: Fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous piano hinge or minimum of two 1-1/2" pin hinges of same metal as unit cabinet. Provide concealed anchorage wherever possible.
- J. Recessed mounted accessories: Fabricate units of all welded construction, without mitered corners. Hang doors or access panels with full-length stainless steel piano hinge. Provide anchorage which is fully concealed when unit is closed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.
- D. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

- A. Install accessories in accordance with manufacturer's instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting heights and locations: As indicated on drawings.

3.04 SCHEDULE

- A. Provide the following items for each dwelling unit bathroom unless noted otherwise.
 1. Toilet paper holder: Bobrick B-76857, stainless steel satin finish, 22 ga. Single roll toilet paper dispenser with chrome plated plastic roll control spindle.

2. Robe hook: Bobrick B-6717 with 2 inch projection and concealed fasteners. Mount where indicated on drawings.
 3. Shower curtain rod: Bobrick B6047 extra heavy duty rod, 18 ga., 1 1/4 inch diameter. (length as required).
 4. Towel hanging bars: Bradley 908 (2 – 24" per tub room and 1—12" per vanity).
 5. Under Lavatory Guard: white, anti-microbial, molded vinyl covering for supply and drain piping assemblies at accessible lavatories. See Mechanical for more information.
 6. Un-frame mirrors as specified in Section 08 83 13 Mirrored Glass.
- B. Accessible dwelling unit bathrooms: In addition to typical dwelling unit accessories, provide to the Owner the following:
1. Grab bars: Bradley 812 Series.
 - a. Sizes and quantity as indicated on drawings.
 2. Provide **but do not install** accessible accessories.
- C. Provide the following items for the public restroom:
1. Two-roll toilet paper dispenser: Bobrick B-6867, stainless steel satin finish, 22 ga. dual roll toilet paper dispenser with chrome plated plastic roll control spindle.
 2. Robe hook: Bobrick B-2116, projects 3 1/2" inches from wall, concealed fasteners, mounted to center of door, one at 4'-0" and one at 5'-6".
 3. Soap dispenser: Bobrick Matrix Series B-5050, wall mounted, vandal resistant lid secured to container with concealed locking device.
 4. Paper towel dispenser: Bobrick B-262.
 5. Grab bars: Bradley 832 Series, or Bobrick 5800 Series (as indicated on drawings and per Code); Satin Stainless Steel, 18 ga., 1 1/4 inch, concealed fasteners.
 6. Under Lavatory Guard: white, anti-microbial, molded vinyl covering for supply and drain piping assemblies at accessible lavatories. See Mechanical for more information.
 7. Framed Mirror as specified in Section 08 83 13 Mirrored Glass.
- D. Provide the following items at each custodial closet:
1. Mop holder Bradley 9953

END OF SECTION 10 2800

SECTION 10 4416
FIRE EXTINGUISHERS AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire extinguishers, cabinets, and accessories.

1.02 RELATED SECTIONS

- A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

1.03 REFERENCES

- A. NFPA 10 - Standard for Portable Fire Extinguishers; National Fire Protection Association; 2002.
- B. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.

1.04 PERFORMANCE REQUIREMENTS

- A. Conform to NFPA 10.
- B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide extinguisher operational features.
- C. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Extinguishers and Accessories:
 - 1. J.L. Industries, Inc.; www.jlindustries.com.
 - 2. Larsen's Manufacturing Co: www.larsensmfg.com.
 - 3. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 FIRE EXTINGUISHER CABINETS

- A. Cabinet Configuration: Semi-recessed and surface-mounted powder-coated steel fire-rated cabinet with rolled edge trim and full glazed door with wire glass, J.L. Industries Product "Ambassador CFX8117F13."

2.03 EXTINGUISHERS

- A. J.L. Industries, Inc., "Cosmic, Model 5E;" Dry Chemical Type 2A-10BC.
- B. Install fire extinguishers in cabinets where indicated on drawings.
- C. Install fire extinguishers with wall hangers where indicated on drawings.

2.04 ACCESSORIES

- A. Extinguisher Brackets: Formed steel, chrome-plated.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure rigidly in place.
- C. Place extinguishers fully charged on wall brackets or in cabinets.

3.02 SCHEDULES

- A. Provide fire extinguisher cabinets as indicated on plans.

END OF SECTION 10 4416

SECTION 10 5524

MAIL BOXES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Mailboxes.
 - 1. Grouped mail boxes located indoors.
 - 2. Fire Department Key box.

1.02 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry: Blocking and opening framing

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for requirements for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog data for specified products.
- C. Shop Drawings: Prepared specifically for this project; show dimensions of mail boxes, wall cuts, box numbering, and interface with other products.

1.04 QUALITY ASSURANCE

- A. Comply with USPS STD-4C regulations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Mailboxes as manufactured by Auth-Florence Manufacturing Company; www.auth-florence.com.
- B. Key Boxes as manufactured by Knox Company: www.knoxbox.com.
- C. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 MAIL BOXES

- A. Mailboxes: High security vault type horizontal style, USPS approved, recessed, with factory installed trim.
 - 1. Model: Versatile 4C Series, Front-loading, configured as shown on the drawings.
 - 2. Total number of units: 33 individual mailboxes, 4 parcel boxes, and 1 outgoing mail slot.
 - 3. Finish: To be selected from manufacturer's complete line of standard finishes.

2.03 KEY BOX

- A. Fire Department access key box. Verify model and location to be installed with the Fire Department.
 - 1. Manufacturer: Knox Company; www.knoxbox.com.
 - 2. Model: Knox Box 3200 Series; surface with mounting kit appropriate to building cladding.
 - 3. Locate at front door or where directed by the Fire Marshal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings in wall are correctly located, aligned, and sized for mail boxes.
- B. Installer's Examination:
 - 1. Examine conditions under which construction activities of this section are to be performed; submit written notification if such conditions are unacceptable.
 - 2. Beginning installation indicates acceptance of conditions.

3.02 INSTALLATION

- A. Install mail boxes in accordance with shop drawings and manufacturer's printed installation instructions.

B. Align, plumb, and level; anchor in accordance with requirements.

END OF SECTION 10 5524

SECTION 10 5615
WIRE STORAGE SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vinyl or epoxy coated ventilated shelving.

1.02 RELATED SECTIONS

- A. Section 06 1000 - Rough Carpentry: Blocking to support shelving units.
- B. Section 06 2000 - Finish Carpentry.
- C. Section 09 2116 - Gypsum Board Assemblies.
- D. Section 10 5723 - Closet and Utility Shelving: Shelving for bedroom closets.

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Manufacturer's catalog data, detail sheets, and specifications.
- C. Shop Drawings: Prepared specifically for this project; show dimensions of shelving and interface with other products.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Coated wire shelving basis of design:
 - 1. ClosetMaid: www.closetmaid.com.
 - a. Hanging Shelves: "Total slide".
 - b. Mounting hardware:
 - 1) Fixed mount hardware system typical.
 - 2. Other Acceptable Manufacturers:
 - a. Rubbermaid; www.rubbermaid.com.
 - b. Schulte Co.; www.schultestorage.com.
 - 3. Design requirements: Shelving shall support 75 pounds per square foot.
 - 4. Provide all storage shelving from a single manufacturer.
 - 5. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 MATERIALS - COATED WIRE SHELVING

- A. Steel Wire: Basic cold drawn, Grade C-1006; average tensile strength over 100,000 psi; coated.
- B. Wire Coating: Proprietary heavy-duty polyvinyl chloride (PVC) formula resin or epoxy, plasticizers, stabilizers, pigments, and other additives.
 - 1. Thickness: 9 to 11 mils.
 - 2. Classification: No ingredients listed as hazardous per OSHA 29CFR1910.1017.

2.03 MANUFACTURED UNITS - COATED WIRE SHELVING

- A. Wire Shelving: Coated steel wire, 5/8 to 1 inch o.c. incremental cross-deck spacings. Clothes closet shelf to have free slide hanger rod.
- B. Provide storage shelving at location shown on the drawings, and as follows:
 - 1. Shelf and rod for closets shall be 12 inches deep, other storage shelving shall be 16 inches deep unless otherwise indicated on drawings. Provide intermediate support brackets for shelving longer than 3'-0".

2.04 ACCESSORIES - COATED WIRE SHELVING

- A. Wall Clips.
- B. Side Wall Brackets.

- C. Support Brackets.
- D. Standards.
- E. Poles.
- F. Wall anchors.
- G. End caps.
- H. Pole Clips.
- I. Down clips.
- J. Shelf stops.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared spaces are sized and located in accordance with shop drawings.
- B. Verify that framing, reinforcement, and anchoring devices are correct type and are located in accordance with shop drawings.

3.02 INSTALLATION - WIRE SHELVING

- A. Cut shelves 1/2 inc shorter than actual wall measurements; cap all exposed ends.
- B. Install shelving plumb and level at heights indicated in accordance with shop drawings and manufacturer's printed installation instructions.
- C. Place wall clips No. 910, 911 every 10 to 12 inches on level line.
- D. Install side wall brackets No. 932 and shelf stops No. 969 on same level line as wall clips, centered on the front rods of shelves. Support shelves 36 inches maximum with side wall brackets, support brackets, or poles.
- E. Drill holes where required using sharp bit; do not punch.
- F. Drywall: Drill 1/4 inch hole, insert No. 910 or 911 wall clip. Use No. 8 pin to expand anchor.
- G. Wood: Drill 1/4 inch hole into wood, secure wall clip with No. 8 x 1 inch screw or secure pole clip No. 978 directly to wood with No. 8 x 1-1/4 inch screws.
- H. Brackets:
 - 1. Install standards vertically no more than 24" apart on studs.
 - 2. Install horizontal tracks level, secured with screws or mollies in studs or drywall; use hanging adapters to connect wall standards for hanging.
 - 3. Attach shelf brackets with SuperSlide, Heavy Duty, Linen, Shelf and Rod and Close Mesh 12-inch or 16-inch decking.
- I. Shelf Supports:
 - 1. Place shelf support brackets No. 1164, 1166, or 1180 vertically to the shelf, attach with No. 954 or 955 wall anchors.
 - 2. Install down clips No. 981/978 or cable clips No. 612 with 1/4 inch anchor on the back rod behind every support bracket.
 - 3. 36 inches o.c. maximum.
- J. Pole: Use pole clip #978 for linen shelving and #977 for shelf + rod shelving on pole #117 or #118.
- K. Use No. 120 corner support brackets on all corner "butt" joints.
- L. For wall to wall installation, use lightning end bracket No. 932 or 933; drill 1/4 inch holes, and secure with No. 8 pins.

3.03 INSTALLATION - WIRE SHELVING

- A. Install per manufacturer's instructions.

3.04 CLEANING

- A. As work proceeds, maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris related to this work.
- B. Upon completion of installation, clean all surfaces that have become soiled during installation.

END OF SECTION 10 5615

SECTION 11 3013
RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Kitchen appliances.
- B. Laundry appliances.

1.02 RELATED REQUIREMENTS

- A. Section 26 0583 - Wiring Connections: Electrical connections for appliances.

1.03 REFERENCE STANDARDS

- A. UL (DIR) - Online Certifications Directory; current listings at database.ul.com.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples, for submittal procedures.
- B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
- C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Electric Appliances: Listed and labeled by UL (DIR) and complying with NEMA Standards (National Electrical Manufacturers Association).
- C. Gas Appliances: Bearing design certification seal of American Gas Association (AGA).

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.
- C. Provide ten (10) year manufacturer warranty on tub and door liner of dishwashers.

PART 2 PRODUCTS

2.01 KITCHEN APPLIANCES

- A. Exterior Finish: Stainless steel unless noted otherwise.
- B. Manufacturers:
 - 1. Broan: www.broan.com.
 - 2. Frigidaire Home Products: www.frigidaire.com/#sle.
 - 3. GE Appliances: www.geappliances.com/#sle.
 - 4. Kenmore: www.kenmore.com.
 - 5. Whirlpool Corp: www.whirlpool.com/#sle.
 - 6. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- C. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.
- D. Refrigerator, Type 10 CUFT: Free-standing, top-mounted freezer, and frost-free.
 - 1. Capacity: Total minimum storage of 10 cubic ft; minimum 15 percent freezer capacity. Must fit in 24" wide x 69" high by 24" deep opening. Door swings shall be reversible. Must be ADA compliant.
 - 2. Features: 2 adjustable glass shelves with spill-proof edges, 2 fresh food drawers, 3 full-width fixed and/or adjustable door shelves, adjustable full-width freezer wire shelf and step shelf 2 fixed freezer door shelves. Freezer to have spill-proof floor.
- E. Refrigerator, Type 15 CUFT: Free-standing, top-mounted freezer, and frost-free.

1. Capacity: Total minimum storage of 15 cubic ft; minimum 15 percent freezer capacity. Must fit in 30"wide x 69" high x 33" deep opening. Door swings shall be reversible. Must be ADA compliant.
 2. Features: 2 adjustable glass shelves and 1 fixed shelf with spill-proof edges, 2 fresh food drawers, 2 full-width fixed and/or adjustable door shelves, adjustable full-width freezer shelf and step shelf 2 fixed freezer door shelves. Freezer to have spill-proof floor.
- F. Refrigerator, 18 CUFT: Free-standing, top-mounted freezer, and frost-free.
1. Capacity: Total minimum storage of 16.5 cubic ft; minimum 15 percent freezer capacity. Must fit in 33"wide x 69" high x 33" deep opening. Door swings shall be reversible. Must be ADA compliant.
 2. Features: 2 adjustable glass shelves and 1 fixed shelf with spill-proof edges, 2 fresh food drawers, 1 dairy compartment, at least 2 full-width fixed and/or adjustable door shelves with gallon storage, adjustable full-width freezer wire shelf and step shelf and 2 fixed freezer door shelves. Freezer to have spill-proof floor.
- G. Range, Type Conventional and ANSI 117.1 Type 'B' Dwelling Units: Electric, free-standing, with glass-ceramic cooktop.
1. Size: 30 inches wide.
 2. Oven: Self-cleaning.
 3. Elements: Four (4).
 4. Controls: Push-to-turn knobs with electronic clock and timer.
 5. Features: Black ceramic cooktop surface, storage drawer, oven door window, 2 oven racks, at least 5 oven rack positions, oven window and oven light. Provide anti-tip device.
- H. Range, Type ANSI 117.1, Type A Accessible Dwelling Units: Electric, free-standing, with glass-ceramic cooktop.
1. Size: 30 inches wide.
 2. Oven: Self-cleaning.
 3. Elements: Four (4).
 4. Controls: Push-to-turn knobs with electronic clock and timer.
 5. Features: Front controls, black ceramic cooktop surface, oven door window, 2 oven racks, at least 5 oven rack positions, oven window and oven light, ADA compliant. Provide anti-tip device.
- I. Cooking Exhaust, Type Accessible ANSI 117.1, Type A Dwelling Units: Range hood.
1. Size: 30 inches wide.
 2. Fan: Two-speed, 180 cfm
 3. Exhaust: Recirculating.
 4. Features: Include cooktop light and removable grease filter.
 - a. Provide controls for exhaust fans in accessible units at blank drawer front adjacent to range.
- J. Grease Shield.
1. 20 gauge 304 brushed stainless steel.
 2. Install on wall behind each range and at sidewall when range is adjacent to sidewall.
- K. Microwave, Type Conventional and ANSI 117.1 Type 'B' Dwelling Units: Over-the-range.
1. Capacity: 1.7 cubic ft.
 2. Power: 1000 watts.
 3. Features: Include turntable, cooktop light, night light, 2-speed exhaust fan, built-in trim kit, undercabinet mounting kit, and pre-programmed settings and manual timer and power setting controls.
- L. Microwave, Type ANSI 117.1 Type 'A' Accessible Dwelling Units: Countertop.
1. Capacity: 1.6 cubic ft.
 2. Power: 1100 watts.
 3. Features: Include turntable and pre-programmed settings and manual timer and power setting controls.

- M. Dishwasher, Type Conventional and ANSI 117.1 Type 'B' Dwelling Units - 24 inch: Undercounter.
 - 1. 24 inches wide to fit under 36 inch high counter.
 - 2. Controls: Solid state electronic.
 - 3. Wash Levels: Two (2).
 - 4. Cycles: Five (5), including normal, rinse and hold, short, china/crystal, and pot and pan.
 - 5. Features: Include rinse aid dispenser, optional no-heat dry, optional water temperature boost, adjustable upper rack, adjustable lower rack, and hidden touch-pad top controls.
- N. Dishwasher, Type Conventional and ANSI 117.1 Type 'B' Dwelling Units - 18 inch: Undercounter.
 - 1. 18 inches wide to fit under 36 inch high counter.
 - 2. Controls: Solid state electronic.
 - 3. Wash Levels: Three (3).
 - 4. Cycles: Five (5), including normal, rinse and hold, short, china/crystal, and pot and pan.
 - 5. Features: Include rinse aid dispenser, optional no-heat dry, optional water temperature boost, adjustable upper rack, adjustable lower rack, and hidden touch-pad top controls.
- O. Dishwasher, Type ANSI 117.1 Type 'A' Accessible Dwelling Units - 24 inch: Undercounter.
 - 1. 24 inches wide to fit under 34 inch high counter.
 - 2. Controls: Solid state electronic.
 - 3. Wash Levels: Three (3).
 - 4. Cycles: Five (5), including normal, rinse and hold, short, china/crystal, and pot and pan.
 - 5. Features: Include rinse aid dispenser, optional no-heat dry, optional water temperature boost, adjustable upper rack, adjustable lower rack, and hidden touch-pad top controls.

2.02 LAUNDRY APPLIANCES

- A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.
- B. Clothes Washer: Front-loading, stackable.
 - 1. Size: 4.5 cubic feet.
 - 2. Controls: Rotary and electronic with LED display.
 - 3. Cycles: Include active wear, basket clean, bulky/bedding, colors/normals, delicates/hand wash, rinse and spin, sanitize, speed wash, towels and sheets, whites, and wrinkle-free.
 - 4. Motor Speed: Variable.
 - 5. Features: Include optional second rinse, bleach dispenser, fabric softener dispenser, self-cleaning lint filter, sound insulation, and end of cycle signal.
 - 6. Finish: Painted steel, color white.
- C. Clothes Dryer: Electric, stationary, stackable.
 - 1. Size: 7.5 cubic feet.
 - 2. Controls: Rotary and electronic with LED display, with electronic moisture-sensing dry control.
 - 3. Temperature Selections: Four.
 - 4. Cycles: Air Fluff, bulky / bedding, cottons, delicates, mixed loads, permanent press/casuals, quick dry and towels and sheets.
 - 5. Features: Include interior light, reversible door, stationary rack, sound insulation, end of cycle signal, and sensor drying feature.
 - 6. Finish: Painted steel, color white.

2.03 ACCESSORIES

- A. Anti-tip devices for free standing ranges.
- B. Connecting hoses for plumbing: Braided stainless steel.
- C. Power chords: Manufacturers standard for wall receptical.
- D. Dryer vent connection: Round aluminum with necessary elbows and fasteners.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify utility rough-ins are provided and correctly located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Connect to plumbing as required.
- C. Plug appliances into wall recepticals.
- D. Connect dryers to vent rough-in.
- E. Install and connect drawer front controls for range hood at accessible dwelling units.
- F. Install anti-tip device at range.

3.03 ADJUSTING

- A. Adjust equipment to provide efficient operation.

3.04 CLEANING

- A. Remove packing materials from equipment and properly discard.
- B. Wash and clean equipment.

END OF SECTION 11 3013

SECTION 12 2113
LOUVER BLINDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Horizontal slat louver blinds.

1.02 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry
 - 1. Concealed wood blocking for attachment of headrail brackets.
 - 2. Blocking for attachment of headrail brackets.

1.03 REFERENCE STANDARDS

- A. WCMA A100.1 - Safety of Corded Window Covering Products; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide data indicating physical and dimensional characteristics.
- C. Shop Drawings: Indicate opening sizes, tolerances required, method of attachment, clearances, and operation.
- D. Samples: Submit two samples, 3 inch long illustrating slat materials and finish, color, cord type and color.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 PROJECT CONDITIONS

- A. Coordinate the work with window installation and placement of concealed blocking to support blinds.
- B. Take field measurements to determine sizes required.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Horizontal Louver Blinds (at all dwelling unit windows):
 - 1. Bali; Product 1" Aluminum Blinds: www.baliblinds.com.
 - 2. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 BLINDS AND BLIND COMPONENTS

- A. Horizontal Louver Blinds:
 - 1. Blinds: Horizontal slat louvers hung from full-width headrail with full-width bottom rail; manual control of raising and lowering by cord with full range locking; blade angle adjustable by control wand; complying with WCMA A100.1.
 - 2. Slats: aluminum; radiused slat corners.
 - a. Width: 1 inch.
 - b. Thickness: 0.006 inch.
 - c. Color: As selected by Architect from manufacturer's standard range.
- B. Accessory Hardware: Type recommended by blind manufacturer.
- C. See Material Finish List and Finish Schedule for style, color and locations of louver blinds.

2.03 FABRICATION

- A. Field measure to verify actual sizes and opening variations.
 - 1. Size blinds to include fixed transom windows over primary windows.

- B. Horizontal Dimensions: Fabricate blinds to fit within openings with uniform edge clearance of 1/4 inch.
- C. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom of vanes and finish floor.
- D. At openings requiring multiple blind units, provide separate blind assemblies with space of 1/4 inch between blinds, located at window mullion centers.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not start installation before openings are finished and all finishes have been completed; do not install until painting is completed.
- B. Verify that openings are ready to receive the work.
- C. Ensure structural blocking and supports are correctly placed.
- D. Field measure finished openings prior to ordering or fabrication.

3.02 INSTALLATION

- A. Install horizontal blinds at all and hung windows.
- B. Install blinds in accordance with manufacturer's instructions.
- C. Secure in place with flush countersunk fasteners.
- D. Place intermediate head supports for blinds over 60 inches wide or 50 square feet in area.

3.03 INSTALLATION TOLERANCES

- A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.
- B. Maximum Offset From Level: 1/8 inch.

3.04 ADJUSTING

- A. Adjust blinds for smooth operation.

3.05 CLEANING

- A. Clean blind surfaces just prior to occupancy.

END OF SECTION 12 2113

SECTION 12 3530
RESIDENTIAL CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Kitchen cabinets.
- B. Kitchen countertops.
- C. Vanity cabinets and countertops.
- D. Toilet topper cabinets.

1.02 REFERENCE STANDARDS

- A. KCMA A161.1 - Performance and Construction Standard for Kitchen and Vanity Cabinets; 2012.
- B. NEMA - National Electric Manufacturers Association Publication LD3.

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Product Data: Provide component dimensions and construction details.
- C. Shop Drawings: Indicate casework locations, large scale plans, elevations, clearances required, rough-in and anchor placement dimensions and tolerances.
- D. Samples: Submit two , 6" x 6" inch in size, illustrating each color of finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Residential Casework: Smart Cabinetry; www.smartcabinetry.com.
 - 1. Other Acceptable Manufacturers:
 - 2. Mid Continent Cabinetry; www.midcontinentcabinetry.com.
 - 3. Substitutions: See Section 01 2513 - Product and Substitution Procedures.

2.02 COMPONENTS

- A. Door style basis of design: Smart Cabinetry "Glacier".
 - 1. Modified full overlay doors and drawers.
- B. Face frames: Painted maple to match door and drawer fronts.
- C. Door and drawer fronts: Powder coated furniture board.
- D. Finish Color: To be selected from manufacturer's standard colors for cabinet front style.
- E. Solid 1/2" drawers with dovetail corner construction.
- F. 3/8" plywood or 1/2" furniture board side and back cabinet box panels.
- G. 6-way adjustable hinges on all doors.
- H. Doors and drawers shall be soft-close.
- I. 3/4" x 1 1/2" solid wood face frames.
- J. Kitchen Countertop: Post formed plastic laminate over particle board, coved to back splash.
- K. Door and Drawer Fronts: Solid wood.

2.03 FABRICATION - GENERAL

- A. All casework shall conform to ANSI/KCMA A161.1 Standards and shall bear the seal indicating conformance to this standard.
- B. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- C. Fabricate corners and joints without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.

2.04 FABRICATION - CABINETS

- A. Provide factory finished casework with Maple facing and melamine lined interior. All shelves in wall units shall be adjustable. Provide bottom panel for base cabinets. Exposed ends of casework shall have a finished panel. Provide matching filler pieces. Casework shall be manufactured without the use of added urea formaldehyde or shall be treated and sealed in a manner preventing emission of formaldehyde. 4 inch wire pulls on all doors. Finish shall be as selected by the Architect from the manufacturer's standard finishes.
- B. Provide face frames with reinforced toe-kick at kitchen sinks and bath lavatories in lieu of full cabinets. Adjacent cabinets to have finished melamine ends.
- C. Drawers shall be full depth and have two slides and tracks with a drawer stop that allows drawer removal. Drawers shall have dovetail joints. Drawers shall have 4" wire pulls. Base shelves to be 1/2 depth. Provide ADA compliant bases for accessible units.
- D. Provide matching prefinished wood trim at kick space and exposed ends and backs.
- E. Provide matching finished cove molding trim piece around the top edge of all upper cabinets.
- F. Provide matching fillers where required so that doors and drawers do not conflict with hardware at corners.

2.05 FABRICATION - PLASTIC LAMINATE COUNTERTOPS AND WALL CAPS

- A. Provide plastic laminate faced countertops with rolled edges and coved backsplashes at kitchens. Provide sidesplash as necessary. Core material for countertops shall be particle board or hardwood faced veneer plywood, 3/4" thick. Plastic laminate shall be a postformable grade, .042" thick, complying with NEMA LD3. Make cutouts for plumbing/electrical devices. Formica or approved equal. Color to be selected from manufacturer's full range of standard colors.
- B. Countertops that overhang the cabinet shall be fully solid-blocked below with 3/4" material so that no void remains between cabinet and countertop.
- C. Countertop backer: Provide 0.020" phenolic backer sheet on underside of countertops.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of support framing.

3.02 INSTALLATION

- A. Install casework, components and accessories in accordance with manufacturer's instructions.
- B. Use anchoring devices to suit conditions and substrate materials encountered.
- C. Set casework items plumb and square, securely anchored to building structure.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Use filler strips; not additional overlay trim for this purpose.
- E. Close ends of units, back splashes, shelves and bases.
- F. Finished back panels at islands and peninsula shall include a base shoe type trim at floor. Provide blocking at floor behind dishwasher so bottom of panel has continuous support along floor.

3.03 ADJUSTING

- A. Adjust doors, drawers, hardware, fixtures, and other moving or operating parts to function smoothly.

3.04 CLEANING

- A. Clean casework, countertops, shelves, and hardware.

END OF SECTION 12 3530

SECTION 14 2010
PASSENGER ELEVATORS

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. Complete elevator system.
- B. Elevator maintenance.

1.02 RELATED SECTIONS

- A. Section 02 4100 - Demolition: Demolition of existing elevator.
- B. Section 05 5000 - Metal Fabrications: Sill supports.
- C. Section 07 7200 - Roof Accessories: Smoke venting hatch at top of hoistway.
- D. Section 09 2116 - Gypsum Board Assemblies: Gypsum shaft walls.
- E. Section 09 6500 - Resilient Flooring: Floor finish in cab.
- F. Section 10 1421 - Interior Signage: Regulatory signage at elevator lobbies.

1.03 REFERENCE STANDARDS

- A. ASME A17.1 - Safety Code for Elevators and Escalators; 2013.
- B. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks; 2014.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.
- E. UL (BMD) - Building Materials Directory; current edition.
- F. UL (ECMD) - Electrical Construction Materials Directory; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a meeting one week prior to starting work.
 - 1. Review schedule of installation, installation procedures and conditions, and coordination with related work.
- B. Construction Use of Elevator: Not permitted.

1.05 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Submittals for Administrative requirements for submittal procedures.
- B. Product Data: Provide data on the following items:
 - 1. Signal and operating fixtures, operating panels, indicators.
 - 2. Cab design, dimensions, layout, and components.
 - 3. Cab and hoistway door and frame details.
 - 4. Electrical characteristics and connection requirements.
- C. Shop Drawings: Indicate the following information:
 - 1. Locations of machine room equipment: driving machines, controllers, governors and other components.
 - 2. Hoistway Components: Car, counterweight, sheaves, machine and sheave beams, guide rails, buffers, ropes, and other components.
 - 3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
 - 4. Individual weight of principal components; load reaction at points of support.
 - 5. Loads on hoisting beams .
 - 6. Clearances and over-travel of car and counterweight.
 - 7. Locations in hoistway and machine room of traveling cables and connections for car light.
 - 8. Location and sizes of access doors, doors, and frames.

9. Expected heat dissipation of elevator equipment in machine room.
 10. Interface with building security system.
 11. Electrical characteristics and connection requirements.
 12. Show arrangement of equipment in machine room so rotating elements, sheaves, and other equipment can be removed for repairs or replaced without disturbing other components. Arrange equipment for clear passage through access door.
 13. Show elevator car plan with a 24" x 84" ambulance stretcher positioned inside compliant with the Minnesota State Building Code.
- D. Product Data: Provide data on the following items:
1. Signal and operating fixtures, operating panels, indicators.
 2. Cab design, dimensions, layout, and components.
 3. Cab and hoistway door and frame details.
 4. Electrical characteristics and connection requirements.
- E. Samples: Submit two samples, 6 x 6 inch in size illustrating cab interior finishes.
- F. Maintenance Contract.
- G. Maintenance Data: Include:
1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
 2. Technical information for servicing operating equipment.
 3. Legible schematic of hydraulic piping and wiring diagrams of installed electrical equipment and changes made in the Work. List symbols corresponding to identity or markings on machine room and hoistway apparatus.
- H. Warranty.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with applicable code and as supplemented in this section.
- B. Design guide rails, brackets, anchors, and machine anchors under direct supervision of a Professional Structural Engineer experienced in design of work of this type and licensed in the State in which the Project is located.
- C. Fabricate and install door and frame assemblies in accordance with NFPA 80.
- D. Perform electrical work in accordance with NFPA 70.
- E. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- F. Installer Qualifications: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.
- G. Products Requiring Fire Resistance Rating: Listed and classified by UL.
- H. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

1.07 WARRANTY

- A. See Section 01 7700 - Project Closeout: For additional warranty requirements.
- B. Provide one year manufacturer warranty for elevator operating equipment and devices.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers to provide traction elevator to fit in existing hoistway and equipment space:
 1. ThyssenKrupp Elevator: www.thyssenkruppelevator.com.
 2. Otis Elevator Company: www.otis.com.
 3. Kone US: www.kone.us.
 4. Schindler Elevator Corp: www.us.schindler.com.

5. Substitutions: See Section 01 2513 - Product and Substitution Procedures.
- B. All components to be manufactured by same entity, unless otherwise indicated.

2.02 ELEVATORS

- A. Traction Elevator System:
1. Operation and Controls: Single Elevator.
 2. Cab Design:
 - a. Cab style: Passenger.
 - b. Side walls: Plastic laminate. Color and pattern to be selected from manufacturer's complete range of standard colors and patterns.
 - c. Front and back walls: Powder-coated steel.
 - d. Car doors: Powder-coated steel..
 - e. Ceiling: LED lighting with suspended diffuser.
 - f. Handrail: Locate at both side walls, ADA compliant, 4" wide straight stainless steel handrail; #4 finish.
 - g. Floor Finish: Rubber tile as specified in Section 09 6500 - Resilient Flooring.
 - h. Sill: Extruded aluminum.
 3. Hoistway Doors and Frames: Powder-coated steel.
 4. Cab Height: 93 inches.
 5. Hoistway and Cab Entrance Frame Opening Size: 42 x 84 inches.
 6. Door Type: Double leaf.
 7. Door Operation: Side opening.
 8. Rated Net Capacity: Not less than 3,500 lbs.
 9. Rated Speed: 150 ft/min.
 10. Existing hoistway dimensions: 7'-4" wide by 8'-2" deep. Dimensions shall be field verified.
 11. Clear Net Platform Size: Not less than 48 x 48 inches.
 12. Travel Distance: 43' 8-1/4". Dimensions shall be field-verified.
 13. Number of Stops: 7.
 14. Number of Openings: 5 Front; 2 Rear.
 15. Traction Machine Location: Overhead.

2.03 CONTROLS

- A. Elevator Controls: Provide landing buttons, hall lanterns, lobby panel, and car-riding lanterns and position indicator.
- B. Door Controls:
1. Program door control to open doors automatically when car arrives at floor.
 2. Render "Door Close" button inoperative when car is standing at dispatching terminal with doors open.
 3. If doors are prevented from closing for approximately ten seconds because of an obstruction, automatically disconnect door reopening devices, close doors more slowly until obstruction is cleared. Sound buzzer.
 4. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equip with photo-electric light rays.
- C. Landing Buttons: Illuminating type, one for originating UP and one for originating DOWN calls, one button only at terminating landings; marked with arrows.
- D. Landing Position Indicators: Illuminating white.
- E. Car Direction Indicators: Illuminating white.
- F. Interconnect elevator control system with building fire alarm systems.
- G. Provide "Firefighter's Operation" in accordance with applicable code. Designated Landing: Main.

2.04 EMERGENCY POWER

- A. Arrange elevator operation to operate under emergency power when normal power supply fails.

- B. Emergency Power Supply: Building emergency power; provide for emergency power characteristics and phase rotation same as for normal power. Provide transfer switches and auxiliary contacts in accordance with specifications in electrical Sections 26-28. Install connections to power feeders.
- C. Provide operational control circuitry for adapting the change from normal to emergency power.

2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Coordinate with elevator installer power requirements.

2.06 ACCESSORIES:

- A. Provide 2 sets protective pads and permanent wall hooks for all walls for both elevators.
 - 1. Pads to have grommets to hang from hooks in elevator cab.
 - 2. Install hooks in elevator cab for protective pads.
- B. Emergency in-car telephone and telephone wiring to cab.
- C. Regulatory signage; "No Smoking".
- D. ADA compliant labeling of controls, landings, etc.
- E. Control/operating panel keys.
- F. Provide wiring to cab for future security camera.
- G. Pit ladder by elevator supplier complying with local elevator codes.
- H. Wall-Mounted Frames: Glazed with clear plastic; sized as required. Provide one for master schematic and one for lubrication chart. Install charts where directed by elevator inspector.
- I. Key Cabinet: Wall-mounted, lockable, keyed to building keying system, for control/operating panel keys. Install key cabinet where directed by elevator inspector.
 - 1. Provide two extra key cabinet keys per building.
 - 2. Provide two extra control/operating panel keys per building.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing elevator, equipment and controls have been demolished.
- B. Verify existing conditions before starting work.
- C. Verify that hoistway, pit, and machine room are ready for work of this section.
- D. Verify that hoistway and pit are ready for work of this section.
- E. Verify hoistway shaft and openings are of correct size and within tolerance.
- F. Verify that electrical power is available and of the correct characteristics.

3.02 PREPARATION

- A. Arrange for temporary electrical power for installation work and testing of elevator components.

3.03 INSTALLATION

- A. Install system components. Connect equipment to building utilities.
- B. Provide conduit, boxes, wiring, and accessories.
- C. Mount machines on vibration and acoustic isolators, on bed plate and concrete pad. Place on structural supports and bearing plates. Securely fasten to building supports. Prevent lateral displacement.
- D. Accommodate equipment in space indicated.
- E. Install guide rails using threaded bolts with metal shims and lock washers under nuts. Compensate for expansion and contraction movement of guide rails.
- F. Accurately machine and align guide rails. Form smooth joints with machined splice plates.
- G. Bolt or weld brackets directly to structural steel hoistway framing.

- H. Field Welds: Chip and clean away oxidation and residue, wire brush; spot prime with two coats.
- I. Coordinate installation of hoistway wall construction.
- J. Install hoistway door sills, frames, and headers in hoistway walls. Grout sills in place. Set entrances in vertical alignment with car openings and aligned with plumb hoistway lines.
- K. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
- L. Adjust equipment for smooth and quiet operation.

3.04 ERECTION TOLERANCES

- A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1.
- B. Cab Movement on Aligned Guide Rails: Smooth movement, with no objectionable lateral or oscillating movement or vibration.

3.05 FIELD QUALITY CONTROL

- A. Testing and inspection by regulatory agencies will be performed at their discretion.
 - 1. Schedule tests with agencies and notify Owner and Architect.
 - 2. Obtain permits required to perform tests.
 - 3. Document regulatory agency tests and inspections in accordance with the requirements of Section 01 4100.
 - 4. Perform tests required by regulatory agencies.
 - 5. Furnish test and approval certificates issued by authorities having jurisdiction.
- B. Perform testing and inspection in accordance with requirements of Section 01 4100.
 - 1. Perform tests as required by ASME A17.2.
 - 2. Provide two weeks written notice of date and time of tests.
 - 3. Supply instruments and execute specific tests.
- C. Perform operational tests in the presence of Owner and Architect.
- D. Operational Tests:
 - 1. Test elevator system by transporting at least four persons up from main floor during a five minute period.
 - 2. At an agreed time during the contract warranty period, and with the building normally occupied using normal building traffic, conduct tests to verify performance. Furnish event recording of all hall call registrations, time initiated, and response time throughout entire normal working day.

3.06 ADJUSTING

- A. Adjust for smooth acceleration and deceleration of car so not to cause passenger discomfort.
- B. Adjust automatic floor leveling feature at each floor to achieve 1/4 inch from flush.

3.07 CLEANING

- A. Remove protective coverings from finished surfaces.
- B. Clean surfaces and components ready for inspection.

3.08 PROTECTION

- A. Do not permit construction traffic within cab after cleaning.
- B. Protect installed products until project completion.
- C. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

3.09 MAINTENANCE

- A. See Section 01 7000 - Execution Requirements, for additional requirements relating to maintenance service.
- B. Provide a separate maintenance contract for specified maintenance service.
 - 1. Provide a proposal for 2 year maintenance service agreement with 24 hour, 7 day-a-week emergency service calls and response.

- C. Perform maintenance work using competent and qualified personnel under the supervision and in the direct employ of the elevator manufacturer or original installer.
- D. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of Owner.
- E. Provide service and maintenance of elevator system and components for one year from Date of Substantial Completion.
- F. Examine system components monthly. Clean, adjust, and lubricate equipment.
- G. Include systematic examination, adjustment, and lubrication of elevator equipment. Maintain hydraulic fluid levels. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original equipment. Replace wire ropes when necessary to maintain the required factor of safety.
- H. Perform work without removing cars during peak traffic periods.
- I. Provide emergency call back service at all hours for this maintenance period.
- J. Maintain an adequate stock of parts for replacement or emergency purposes locally, near the place of the Work. Have personnel available to ensure the fulfillment of this maintenance service, without unreasonable loss of time.

END OF SECTION 14 2010

SECTION 31 0000
EARTHWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Provide labor, materials and equipment for site clearing, excavation, filling, backfilling, grading, and site work as necessary to complete construction of the project.
- B. Include the following items in the base bid:
 - 1. Work specified in the contract documents and described in geotechnical reports and letters, including required soil corrections.
 - 2. Importing and placement of engineered fill material below paved areas, as required to bring site to grade.
 - 3. Importing or exporting of material required to balance the site.
- C. Verify the location of existing utilities in affected areas and protect them accordingly during construction. Notify the Gopher State One-Call Agency before performing construction.
- D. Review and be familiar with the site and existing site conditions including the soil reports and letters.
- E. Work under this Section will include but not be limited to the following:
 - 1. Erosion control.
 - 2. Clearing of building site.
 - 3. Stripping and stockpiling of topsoil for reuse.
 - 4. Removal of objectionable materials, bedrock, fill soils and organic soils from under new paving locations.
 - 5. Protection of underground utilities to remain.
 - 6. Drainage and dewatering as necessary for work.
 - 7. Removal of surficial deposits and placement of engineered fill.
 - 8. Test rolling of subgrade, subcutting, and replacement of weak areas.
 - 9. Placing and compaction of base and backfill material under new building, slab and paving locations.
 - 10. Rough grading.
 - 11. Placement of top soil and finish grading.
 - 12. Removal of excess materials.
 - 13. Coordination with landscaping contractor.
 - 14. Coordination with utility contractors.
 - 15. Seeding disturbed areas not scheduled for landscape work, interim seeding of early earthwork areas as applicable, and as needed for erosion control.
 - 16. Seeding as needed for site restoration and erosion control.
 - 17. Quality control inspections and tests.
 - a. Contractor to schedule testing. Owner to pay for Geotechnical testing.

1.02 REFERENCES

- A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2014.
- B. ASTM D1556/D1556M - Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method; 2015, with Editorial Revision (2016).
- C. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017.
- D. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2017.
- E. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012, with Editorial Revision (2015).

- F. American Association of State Highway Transportation Officials (AASHTO) tests equivalent to ASTM tests referenced above may be used in place of ASTM tests.
- G. Minnesota Department of Transportation (Mn/DOT), Standard Specifications for Construction, 2018 edition.

1.03 SUBMITTALS

- A. Make in accordance with this Section and the requirements of Division 01 - General Requirements.
- B. Geotechnical Consultant and Testing Agency reports: As described herein.
- C. Geotextile: Manufacturer's test results submitted 15 days prior to installing for geotextile as specified herein.
- D. Record Drawings: Submit record as-built surveys for grading for each site.
 - 1. Submit to City record drawings in reproducible and electronic format according to City requirements.
 - 2. Submit to Architect record drawings in electronic PDF and .dwg (AutoCAD) formats.

1.04 TESTING AND INSPECTION SERVICE

- A. Geotechnical Consultant and Testing Agency is responsible for the following observations and analyses and to prepare tests and reports to document findings:
 - 1. Observation of subgrade preparation for slabs-on-grade, and pavements (including pavers).
 - 2. Observation of the completed excavation for slabs-on-grade, and pavements, coupled with a suitable amount of density testing to determine that the exposed soils are ready for backfilling or the proposed construction.
 - 3. Observation of proof rolling and recommendations for subgrade corrections.
 - 4. Analysis and approval of fill and backfill materials, whether from on-site or off-site sources.
 - 5. Observation and testing of filling and backfilling operations, including compaction work.
 - 6. Analysis and approval of topsoil.
- B. Notify the Geotechnical Consultant and Testing Agency sufficiently in advance of operations to allow for their assignment of personnel and the scheduling of tests. Assist the Geotechnical Consultant and Testing Agency in performing inspections and soil testing for quality control.
- C. The Geotechnical Consultant and Testing Agency shall submit copies of reports to satisfy the minimum requirements as described in the Quality Control article near the end of this specification section. Submit copies to the Owner, Architect, Structural Engineer, Civil Engineer, City Engineer, and the General Contractor.
- D. The Geotechnical Consultant and Testing Agency shall promptly notify the Architect and Contractor of irregularities or deficiencies of work which are observed during performance of services. If in the opinion of the Architect, additional tests are required beyond those specified and their results indicate results not meeting that specified, the Contractor shall bear the expense of such additional tests ordered.
- E. The Geotechnical Consultant and Testing Agency's presence does not include supervision or direction of the actual work of the Contractor. Neither the presence of the Geotechnical Consultant and Testing Agency, nor any observations and testing performed by him shall excuse the Contractor from defects discovered in his work.
- F. Geotechnical Consultant and Testing Agency direction and instructions supersede direction provided in this specification.

1.05 UNFORESEEN CONDITIONS

- A. If unsatisfactory soil materials are encountered at design elevations and below those reasonably inferred from the contract documents, continue excavation as directed by the Architect, observed by the Geotechnical Consultant and Testing Agency, and approved by the Owner. If conditions are not a result of Contractor's negligence, additional excavation will be measured as directed by the Architect and paid for in accordance with contract conditions relative to changes

in work. Deviation in quantities (credit or sold) of work shall be based on quantities of work observed by the Geotechnical Consultant and Testing Agency and be paid at unit prices (in place measurement) as described below.

1.06 DEFINITIONS

- A. Subgrade - The surface of soil or rock immediately below constructed features. The subgrade of floors and pavements is the surface of the soil or rock immediately below the floor or pavement section (i.e., pavement and base course).
- B. Soil Correction - The subcutting and replacement of Unsuitable Materials.
- C. Structural Fill - Fill placed below footings and forming a volume extending minimally 2 feet beyond the edge of footings and extending downward at a 1:1 slope to competent approved subgrade.
- D. Primary Support Fill - Fill placed beneath building slabs or pavements. For pavements this fill forms a volume extending minimally 1 foot beyond the edge of the pavement (or back of curb if applicable) and extending downward at a 1:1 slope to competent approved subgrade.
- E. Foundation Backfill - Backfill placed against foundation walls below the lowest floor elevation. It is placed in even increments on both sides of the foundation wall.
- F. Building Wall Backfill - Backfill placed against a building wall above the lowest floor elevation resulting in earth on one side of the wall, with building space on the other side.
- G. Sand Cushion - 4 inch thick cushion used under building slabs.
- H. Utility Trench Backfill - Backfill placed in utility trenches.
- I. General Fill - Fill not otherwise defined.
- J. Lift - The maximum thickness of loose material that may be placed prior to compaction.
- K. Uncontrolled Fill - Fill, typically from past construction, for which undependable or no documentation exists regarding the type of materials or level of compaction. Therefore, this material is of undependable integrity and requires partial or complete removal where new construction is proposed which will impose some type of loading.
- L. Pipe Bedding - Soil material placed in the bottom of the utility trench to form a foundation for the piping, and providing protection from pipe degradation due to corrosion.
- M. Initial Backfill - Soil material placed over the Pipe Bedding and around the pipe to a level of 12 inches above the top of the pipe, and providing protection from pipe degradation due to corrosion.
- N. Topsoil - The upper layer of the soil profile which is supporting the growth of vegetation as evidenced by the existence therein of numerous roots and other organic matter.
- O. Rock - Sound and solid mass, layer or ledge of mineral matter in place of such hardness and texture that it evidences the following characteristics:
 - 1. Mechanical Definition of Rock: Cannot be effectively loosened or broken down by ripping in a single pass with a late model tractor-mounted hydraulic ripper equipped with one digging point of standard manufacturer's design adequately sized for use with and propelled by a crawler type tractor rated between 210- and 240-net flywheel horsepower, operating in low gear, or
 - 2. Manual Definition of Rock: In areas where the use of the ripper described above is impracticable, rock defined as sound material of such hardness and texture that it cannot be loosened or broken by a 6 pound drifting pick. The drifting pick shall have a handle not less than 34 inches in length.
- P. Rough Grade - Constructed grade outside of the building envelope at the subgrade elevation of surface toppings such as pavements and topsoil.
- Q. Finish Grade - Constructed grade outside of the building envelope for the finished surface of the site. Spot elevations and contours indicated in the drawings represent finish grade. This grade is the top of surface toppings such as pavements and topsoil. For sodded areas, this grade is the top surface of the 2 inch thick sod layer.

- R. Gas Permeable Aggregate - Fill underslabs containing voids and with no fines to allow underslab gases to travel to vent pipe.

1.07 ENVIRONMENTAL PROTECTIONS

- A. Control air pollution caused by dust and dirt and comply with governing regulations.
- B. If contaminated soils or hazardous materials are encountered during demolition or earthwork operations, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection, against exposure or environmental pollution. If hazardous materials are discovered, stop work and notify Architect and Owner.

1.08 PRECONSTRUCTION MEETING

- A. Schedule a preconstruction meeting prior to starting work. Include the City Engineer, Subcontractors, Owner, Architect and Civil Engineer.

1.09 WARRANTY PERIOD

- A. Guarantee workmanship furnished for a period of one year from the date of written acceptance of the work or project by the Owner.

1.10 EXISTING PROJECT CONDITIONS

- A. Conduct excavation to minimize interference with adjacent structures, pavements and landscaped areas outside the construction limits.
- B. Erect and maintain temporary barriers and security devices.
- C. Conduct operations with minimum interference to public or private thoroughfares. Maintain protected egress and access at all times.
- D. Notify the City Engineer prior to partial blockage or closure of any street or public right-of-way. No street or public right-of-way shall be closed without prior approval of the City Engineer.
- E. The Contractor is responsible for all on-site and off-site traffic control during execution of the work. Conform to the 2012 Minnesota MUTCD requirements including the field manual dated current to the year the project is bid.

PART 2 PRODUCTS

2.01 GENERAL - SOIL APPROVALS

- A. Existing site soil materials may be re-used if approved by the Geotechnical Consultant and Testing Agency. Soil materials obtained from off-site may be used if approved by the Geotechnical Consultant and Testing Agency before bringing the materials to the site.

2.02 UNSUITABLE MATERIAL

- A. Mixtures of soil containing organic and inorganic matter such as humus, spongy matter, roots, stumps, muck, peat, topsoil, frozen matter, cobbles greater than 6 inches, existing structures, debris, other manmade materials, and other unstable or objectionable matter as designated by the Geotechnical Consultant and Testing Agency and Geotechnical Report.

2.03 SELECT SUITABLE MATERIAL

- A. Non-expansive mineral soil, free of significant rock quantities, having a plasticity index of 15 or less, and a liquid limit of 40 or less, and free of materials that may prevent attaining specified density, or as modified by the Geotechnical Consultant and Testing Agency. Maximum size of stone or fragmentary rock for use as fill is 3 inches, as measured in their greatest dimension. Lean clay soils, and clean granular soils such as Select Granular Material meet the requirements for Select Suitable Material.

2.04 COURSE FILTER AGGREGATE

- A. Free-draining mineral product meeting the requirements of MnDOT Standard Specification Section 3149.2H

2.05 GAS PERMEABLE AGGREGATE

- A. Base under dwelling units on slabs-on-grade locations.

- B. Underslab gas permeable aggregate shall be crushed rock, crushed concrete or natural gravel. 100 percent of material shall pass a 2 inches screen. Less than 5 percent of material shall pass 1/4 inch screen. Suitable materials include:
 - 1. Mn/DOT "CA" coarse concrete aggregate.
 - 2. Washed 2 inches natural gravel.
 - 3. Pea rock.

2.06 SELECT GRANULAR MATERIAL

- A. Clean granular soil material meeting the following gradation requirements, or as modified by the Geotechnical Consultant and Testing Agency.
 - 1. 100 percent passing the 2 inch sieve.
 - 2. Meet the requirements for Mn/DOT standard specification 3149.2B2.
 - 3. Less than 50 percent passing the No. 40 sieve.
 - 4. No more than 5 percent passing the No. 200 sieve.
 - 5. Soils meeting ASTM D2487 categories SP, SW, GP, or GW may qualify.

2.07 SAND CUSHION

- A. Clean medium to coarse sand meeting the following gradation requirements, or as modified by the Geotechnical Consultant and Testing Agency.
 - 1. 85-100 percent passing the 3/8 inch sieve.
 - 2. 10-50 percent passing the No. 4 sieve.
 - 3. 0-25 percent passing the No. 8 sieve.
 - 4. No more than 3 percent passing the No. 200 sieve.

2.08 STRUCTURAL GRAVEL

- A. Granular soil meeting the following gradation requirements, or as modified by the Geotechnical Consultant and Testing Agency.
 - 1. 100 percent passing the 2 inch sieve.
 - 2. 50-90 percent passing the No. 4 sieve.
 - 3. 20-60 percent passing the No 40 sieve.
 - 4. 10-50 percent passing the No. 100 sieve.
 - 5. No more than 5 percent passing the No. 200 sieve.

2.09 RIP RAP

- A. MnDOT Specification Section 3601. Class as designated on the drawings.

2.10 UTILITY TRENCH MATERIAL SIZE RESTRICTIONS:

- A. Pipe Bedding: 0.5 inches
- B. Initial Backfill: 0.5 inches
- C. Utility Trench Backfill: 1.5 inches

2.11 TOPSOIL

- A. Import topsoil mix for all lawn, shrub and perennial bed areas.
- B. Import clean pulverized topsoil mixture without weeds, roots, or woody stems. Import topsoil mix of one part loam topsoil defined by MNDOT to one part coarse sand to one part organic material such as compost or organic peat. Ratio is base on volume not weight.
- C. Organic Content: 5 percent - 20 percent.
- D. pH value between: 6.6 to 7.0.
- E. Existing on-site topsoil may be used if conforming to foregoing specified requirements.

2.12 PLANTING SOIL

- A. Use this soil for perennial beds, ground covers, and as indicated in the drawings.
- B. 10 percent clay loam.
- C. 70 percent select granular material.

- D. 10 percent peat moss with 2 pounds.
- E. 10-0-10 fertilizer per cubic yard.
- F. 1 pound of isolite porous ceramic soil additive per square foot thoroughly mixed into the top 6 inches of soil by rototilling.

2.13 GEOTEXTILE (FOR SEPARATING SOIL MATERIALS)

- A. 3733 Type V or as designated by the Geotechnical Consultant and Testing Agency.

2.14 EROSION CONTROL BLANKET

- A. MnDOT Specification Section 3885 Category 2 and 3 or as designated by the Geotechnical Consultant and Testing Agency.

2.15 SOD

- A. Refer to requirements of Section 32 9223 - Sodding.

2.16 SEED

- A. Refer to requirements of Section 32 9219 - Seeding.

PART 3 EXECUTION

3.01 GENERAL

- A. Perform earthwork and soil correction in accordance with these specifications and as directed by the soils reports and Geotechnical Consultant and Testing Agency. Soils reports and Geotechnical Consultant and Testing Agency direction supersede these specifications. Notify Architect of discrepancies in a timely manner.
- B. If contaminated soil is encountered during excavation or construction of underground utilities, stop work and notify the Owner.
- C. Do not export desirable soils and replace with less desirable soils in areas on-site without the written approval of the Owner and Architect.

3.02 PROTECTIONS & PRECAUTIONS

- A. Provide temporary fences, barricades, coverings, or other protections to preserve existing items to remain and to prevent injury or damage to person or property. Apply protections to adjacent properties as required.
- B. Adjacent Features: Conduct trenching and excavation to minimize interference with adjacent structures, pavements and landscaped areas. Provide necessary bracing, sheeting, shoring or similar techniques to protect adjacent infrastructure such as roadways and utilities and structures such as homes from damage due to earthwork operations. Assume responsibility for protecting adjacent features and restore damage to original or better conditions at no cost to the Owner.
- C. Utilities: Drawings indicate approximate locations of existing utilities. All utilities may not be indicated. Cooperate with Owner and utility companies for maintaining services. Verify the location of existing utilities in the area affected by construction and protect accordingly. Be cognizant of the depth of cover over utilities and take care to protect them from superimposed loads, frost, and freezing. Do not disrupt utility connections without providing temporary services. Exercise extreme care in excavating to prevent damage to existing utilities. Perform excavation near existing utilities by hand. Repair damages to existing utilities as directed by utility company. Pay costs for repairing utilities damaged due to earthwork operations at no cost to the Owner.
- D. Water: Prevent water from ponding in excavations by carefully scheduling excavation and fill procedures, maintaining grading, and providing diversion ditches, sumps, pumps, dewatering systems, and the like to convey water to an approved discharge point. Remove water prior to filling. Smooth-roll exposed earthen areas before the end of the workday to seal and protect these areas. Grade around buildings so that ground is pitched to prevent water from running into excavated areas and damaging structures. Prevent water from entering pits and trenches where footings are to be placed. Provide dewatering equipment to keep excavated areas clear

of groundwater or surface runoff during construction so as to not adversely affect construction procedures or cause excessive disturbance of underlying natural ground or footing and slab subgrade. Where in the opinion of the Geotechnical Consultant and Testing Agency, a dry firm subgrade is not being maintained, employ other methods acceptable to the Geotechnical Consultant and Testing Agency.

- E. Freezing: Do not allow freezing of subgrade or fill soils, and, do not use frozen fill soils.
- F. Sensitive Soils: Subgrade soils may be sensitive to disturbance and potential loss of strength under construction traffic and/or excessive moisture or freeze/thaw conditions. Therefore, work with appropriate equipment such as tracked excavators and non-vibratory compaction equipment, with a minimum of abrupt movements in order to avoid soil disturbance. Do not allow water to pond on sensitive soils. Reference soils reports and consult the Geotechnical Consultant and Testing Agency for direction regarding sensitive soil conditions.
- G. New Work: Protect newly graded areas from traffic and erosion. Repair settlement and washing that occurs prior to acceptance of work. Re-establish grades to required elevations and slopes as required for Landscape Contractor.
- H. Monuments: Do not disturb monuments or stakes found on-site or off-site.
- I. Security Devices: Provide and maintain temporary barriers and security devices.
- J. Traffic Control & Protections:
 - 1. Conduct operations with minimum interference to public or private thoroughfares. Maintain continual protected egress and access.
 - 2. Prior to performing work, coordinate with city or other applicable street/right-of-way jurisdiction, to erect barricades to protect the traveling public, both vehicular and pedestrian in accordance with Mn/DOT specification section 1710 or as required by applicable officials. Do not disrupt, block, or close public street or walks without proper approvals.
 - 3. Develop, provide, maintain, and remove traffic controls.
 - 4. The Architect will not approve plans for technical competence.

3.03 PREPARATION

- A. Permits and Notifications: Obtain and conform to required permits prior to initiating excavation work. Notify city and watershed district prior to commencement of earthwork operations. Provide notifications in advance of the required minimum lead times.
- B. Photographs: Prior to commencement of earthwork operations, inspect areas in which work will be performed. Photograph existing conditions of surrounding properties which could be misconstrued as damaged resulting from earthwork or demolition work.
- C. Erosion & Sediment Control: Provide erosion and sediment control prior to initiating earthwork operations as indicated on the Drawings.
- D. Layout & Elevations: Lay out site earthwork and establish site earthwork elevations based on control points and bench marks used in the drawings.
- E. Unused Utilities: Remove, plug or cap, as required, inactive and abandoned utilities encountered in earthwork operations.
- F. Existing Building Foundations: Remove all existing building foundations encountered in the excavation to a minimum depth of 2 feet below all proposed structure floors or foundations.
- G. Discrepancies: Notify Architect of discrepancies in a timely manner.

3.04 CLEARING AND GRUBBING

- A. Acceptance: Accept the site as found and remove trash, rubbish and other debris.
- B. Tree Preservation: Prior to initiating excavation operations, notify Architect to identify trees to be preserved. Provide orange mesh fence around the tree driplines as required by the Architect or City.

- C. Tree & Vegetation Removal: Remove trees, saplings, shrubs, bushes, vines and undergrowth as required for execution of construction except for plantings to remain as indicated in the drawings.
- D. Stump Removal: Remove stumps and roots systems within the limits of new construction to the following depths below the bottom of the respective proposed features:
 - 1. Walks 12 inches
 - 2. Drives 18 inches
 - 3. Building Areas 18 inches
 - 4. Parking Areas 12 inches
 - 5. Lawn Areas 8 inches
 - 6. Fill Areas 12 inches
 - 7. Where drives, walks and other construction or fills overlap, the greater depth applies.
- E. Burning: Burning of materials on-site is prohibited.
- F. Existing Structures: Remove existing foundations, structures, slabs and other manmade materials.

3.05 STRIPPING

- A. Remove topsoil and/or surface vegetation to its entire depth from construction areas. Remove topsoil in other areas in accordance with instructions of the soils reports and Geotechnical Consultant and Testing Agency direction.
- B. Stockpile topsoil in an area designated on the plans or as approved by the Owner where it will not interfere with building or utility operations.
- C. Stockpile a sufficient quantity for respreading on turf and planting areas.

3.06 COMPACTION STANDARD

- A. ASTM D698 for densities established by the Standard Proctor Method.

3.07 FOUNDATION AND FILL REMOVAL

- A. Remove unsuitable soils, foundations or existing structures, and pavements from the area, within 3 feet of the surface of the proposed sub-grade.

3.08 EXCAVATION & SUBGRADE PREPARATION

- A. General:
 - 1. Excavate to the elevations and dimensions indicated in the drawings or as directed by the soils report. Remove Unsuitable Material encountered in the excavation where loading will be superimposed or where fill will be placed as directed by the Geotechnical Consultant and Testing Agency. Replace soils as specified in the Filling article below or as directed by the Geotechnical Consultant and Testing Agency.
 - 2. Compact subgrade by rolling with vibratory or non-vibratory means using tamping roller, pneumatic tired rollers, three-wheel power rollers, sheep's foot roller, or other approved equipment suited to the soil being compacted. Obtain approval from the Geotechnical Consultant and Testing Agency for the type of equipment used in the work.
 - 3. Surface compact the exposed existing soil with a large, smooth-drum self propelled compactor capable of exerting a centrifugal force of no less than 50,000 pounds. Compact soils with a minimum of six passes (three down and back) in each of two perpendicular directions. Obtain approval from the Geotechnical Consultant and Testing Agency for the type of equipment used in the work.
 - 4. Moisture condition the subgrade as necessary to achieve proper compaction. Moisture condition by discing or scarifying soil then aerating soil if too wet, or, sprinkle with water if too dry. Provide water source and sufficient hoses or water distributing equipment at the site for this purpose.
 - 5. Schedule Geotechnical Consultant and Testing Agency to approve subgrades prior to mobilizing equipment and materials for concrete work. Schedule during heavy equipment operations so that the Geotechnical Consultant and Testing Agency can observe the

reaction of soils under heavy equipment loading as described in the Proof Rolling article herein.

6. Notify Owner and Architect within 24 hours of subsurface conditions not anticipated in the Contract Documents and prior to performing extra excavation not described in the drawings or soils reports.

B. Pavements:

1. Excavate to pavement section subgrade elevation. Provide Primary Support Fill as necessary to establish pavement section subgrade. For Primary Support Fill, if required, excavate laterally down and away from footing edges to competent approved subgrade as described in the Definitions article for Primary Support Fill. Prepare subgrade of undisturbed earth of bottom of Primary Support Fill to the required width.

3.09 PROOF ROLLING (TEST ROLLING)

- A. Proof roll subgrades which are required to meet specific compacted densities prior to placing overlying fill soils or structures.
- B. Proof roll aggregate base prior to placing bituminous or concrete pavement.
- C. Proof roll with a loaded tandem axle truck or other acceptable equipment. Slowly roll equipment back and forth over entire subgrade. Make successive passes not greater than one-half the axle width from previous pass to insure thorough coverage of subgrade.
- D. Proof-roll each area of building and pavement in its entirety. If this is not possible, proof-roll areas large enough to allow for an efficient operation as directed by the Geotechnical Consultant and Testing Agency.
- E. Schedule Geotechnical Consultant and Testing Agency to observe proof rolling operations for excessive deflection of soft, weak and unstable areas. Where subgrade evidences excessive deflection, or, has been softened or eroded by flooding, unfavorable weather, or site construction operations, remove incompetent soils, replace, and recompact as directed by the Geotechnical Consultant and Testing Agency.

3.10 GEOTEXTILE

- A. The Geotechnical Consultant and Testing Agency will determine locations where geotextile may be used as an alternative to removal of Unsuitable Soils in some areas.
- B. Where geotextile is used, follow manufacturer's instructions for placement and as directed by the Geotechnical Consultant and Testing Agency.

3.11 FILLING

- A. General:
 1. Fill to the elevations and dimensions indicated in the drawings or as directed by the soils report. Fill excavations resulting from the removal of Unsuitable Materials as directed by the Geotechnical Consultant and Testing Agency.
 2. Compact fill in lifts by rolling with vibratory or non-vibratory means using tamping roller, pneumatic tired rollers, three-wheel power rollers, sheep's foot roller, or other approved equipment suited to the soil being compacted. Obtain approval from the Geotechnical Consultant and Testing Agency for the type of equipment used in the work.
 3. Moisture condition fill soils as necessary to achieve proper compaction. Moisture condition by discing or scarifying soil then aerating soil if too wet, or, sprinkle with water if too dry. Provide water source and sufficient hoses or water distributing equipment at the site for this purpose.
 4. Where fill is to be placed on side slopes, bench the base and scarify after topsoil stripping.
 5. Do not allow bearing capacity of subgrade under footings and foundations to be less than the net allowable bearing capacity used in the design.
 6. Do not place, spread, or roll frozen fill. Do not place fill on frozen ground where frost has penetrated greater than 1 inch.
 7. Do not place fill in standing water or over softened soils.

8. Do not place fill during unfavorable weather. When work is interrupted by unfavorable weather, do not resume fill operations until the density and moisture content of previously placed fill is as specified.
9. Smooth-roll fill areas before the end of the workday to seal and protect these areas.
10. Limit compaction with non self-propelled compaction equipment to maximum lifts of 6 inches.
11. Do not begin backfilling of walls (including retaining walls) until forms are removed, walls have been braced, the excavation is cleaned of trash and debris, and below grade work of other Sections has been completed. Do not place backfill against walls (including retaining walls) prior to 4 days after completion of cast-in-place concrete.
12. Prior to backfilling Building Walls notify Architect and have waterproofing manufacturer inspect the waterproofing. Complete and/or repair areas not adequately waterproofed according to manufacturer's direction. Have waterproofing manufacturer reinspect at no additional cost to the Owner. Do not backfill Building Walls until waterproofing is approved by the manufacturer.
13. Place backfill around structures as the work of construction progresses. Exercise extreme care near walls. Provide adequate bracing or other protection as necessary. Do not operate heavy equipment close to walls without adequate support for walls. For Foundation Walls, bring backfill to the elevations indicated in the drawings in even increments on each side of the wall.
14. Where grade differs on opposite sides of a wall, compact backfill material along face of wall in layers and not more than 8 inches in compacted thickness with power-driven hand tampers. Compact each layer to minimum percentages as specified herein.
15. Have Geotechnical Consultant and Testing Agency approve material types, fill placement, and finished subgrade for foundations, slabs, and pavements. Additionally, schedule during heavy equipment operations so that the Geotechnical Consultant and Testing Agency can observe the reaction of soils under heavy equipment loading as described in the Proof Rolling article herein.
16. If soils inspections, analysis, or testing indicate that the materials specified have not been furnished, placed, and compacted in compliance with these specifications or as directed by the Geotechnical Consultant and Testing Agency, remove the material, replace, and recompact until approval from the Geotechnical Consultant and Testing Agency is obtained.

B. Fill Types:

1. General Fill:
 - a. Allowable Materials: All soil materials listed in Part 2, except Unsuitable Material.
 - b. Maximum Lift: 8 inches
 - c. Compaction: 95 percent; 90 percent below landscaped surfaces
 - d. Moisture Content: Within 3 percent of optimum for soil with less than or equal to 12 percent passing No. 200 sieve; -1 to +3 of optimum for soil with greater than 12 percent passing the No. 200 sieve.
2. Structural Fill:
 - a. Allowable Materials: Select Granular Material, Structural Gravel.
 - b. Maximum Lift: 6 inches
 - c. Compaction: 95 percent
 - d. Moisture Content: Within 3 percent of optimum.
3. Primary Support Fill:
 - a. Allowable Materials: Select Granular Material, Structural Gravel.
 - b. Maximum Lift: 6 inches in building and foundation areas, utility trenches; 8 inches elsewhere
 - c. Compaction: 100 percent; 95 percent where greater than 3' below pavement subgrade elevations.
 - d. Moisture Content: Within -3 percent to +1 percent of optimum.
4. Building Wall Backfill:
 - a. Allowable Materials: Select Granular Material, Structural Gravel.

- b. Maximum Lift: 6 inches
- c. Compaction: 95 percent
- d. Moisture Content: Within 3 percent of optimum.
- 5. Foundation Backfill
 - a. Allowable Materials: Select Granular Material, Select Suitable Material.
 - b. Maximum Lift: 6 inches
 - c. Compaction: 95 percent
 - d. Moisture Content: Within Within 3 percent of optimum for soil with less than or equal to 12 percent passing No. 200 sieve; -1 to +3 of optimum for soil with greather than 12 percent passing the No. 200 sieve.
- 6. Pipe Bedding:
 - a. Allowable Materials: Select Granular Material, Course Filter Aggregate
 - b. Maximum Lift: 6"
 - c. Compaction: 98 percent.
 - d. Moisture Content: Within 3 percent of optimum.
- 7. Initial Backfill:
 - a. Allowable Materials: Select Granular Material
 - b. Maximum Lift: 6"
 - c. Compaction: 98 percent.
 - d. Moisture Content: Within 3 percent of optimum.
- 8. Utility Trench Backfill:
 - a. Allowable Materials: Select Granular Material, Select Suitable Material
 - b. Maximum Lift: 6"
 - c. Compaction: 98 percent.
 - d. Moisture Content: Within 3 percent of optimum.

3.12 BOND BREAK AT ADFREEZE ZONES FOR ISOLATED FOOTINGS

- A. Prevent isolated footings and foundations from frost movement by providing a bond break between the foundation and the soil (adfreeze zone). The bond break may be obtained by wrapping the footing or foundation with polyethylene wrap and backfilling with Select Granular Material within 3 inches of the foundation, or as directed by the Geotechnical Consultant and Testing Agency.

3.13 ROUGH GRADING

- A. Plan grades indicate finish grades. Rough grade to transform the site to the subgrade elevations of surface toppings such as pavements (including base), topsoil, and sod. Complete rough grading by blading to grade uniformly without awkward or abrupt grade transitions.
- B. Slope grade to drain away from the building.
- C. Remove large stones, boulders and debris from the site.
- D. Tolerances:
 - 1. Top Surface of Subgrade: Plus or minus ½ inch.
 - 2. Top Surface of Backfilling: Plus or minus ½ inch.

3.14 PLACEMENT OF TOPSOIL

- A. Scarify subgrade to a depth of 4 inches.
- B. Place topsoil to the thicknesses indicated in the drawings at areas previously stripped. Do not place topsoil in building or paved areas. Install so that the surface of the topsoil is 2 inches below finish grade for areas to be sodded.
- C. Seeding:
 - 1. Refer to requirements of Section 32 9219 - Seeding.
 - 2. Seed and disc mulch topsoil in disturbed areas not scheduled for landscaping by Landscape Contractor.
- D. Sod or seed and disc mulch topsoil in disturbed areas not scheduled for landscaping.

3.15 FINISH GRADING

- A. Plan grades indicate finish grades. Finish grade to transform the site to the elevations indicated in the drawings without awkward or abrupt grade transitions. Grade so that water will drain readily away from the building and off-site by means of contours, ditches, swales and drainage facilities as indicated in the drawings.
- B. Ensure that exterior underground utility work is completed before finish grading is started.
- C. Bring areas to be sodded to within 2 inches of final grade using topsoil.
- D. Tolerances: Plus or minus ½ inch.

3.16 EROSION CONTROL BLANKET

- A. Provide erosion control blanket at the locations indicated in the drawings or for slopes exceeding 4:1 (horizontal:vertical).
- B. Where erosion control blanket is used, follow manufacturer's instructions for placement and as directed by the Geotechnical Consultant and Testing Agency.

3.17 EARTHWORK BALANCE & DISPOSAL

- A. Earthwork Balance: The earthwork for the site is not intended to balance. Review soils reports for anticipated on-site soils and determine import and export quantities. Supply and import the necessary materials to the site.
- B. Disposal: Remove excess materials and unsuitable materials from the site and dispose of legally.

3.18 CLEANUP & RESTORATION

- A. Cleanup: Thoroughly police and rake the site and adjacent areas as required to provide neat clean surfaces.
- B. Restoration:
 - 1. Restore on-site and off-site areas disturbed by construction operations to original or better conditions. Restore turf areas by seed or sod, as directed by the Owner of the disturbed surface.
 - 2. Refer to Section 32 9219 - Seeding for additional seeding information.
 - 3. Provide seed at turf areas that are not sodded. At seed areas, provide erosion control blanket for slopes exceeding 4:1 (horizontal:vertical).
- C. Conduct earthwork operations in a manner that prevents spillage on streets and adjacent areas. Clean up spillage, on-site and off-site caused by earthwork operations.
- D. Remove construction sediment from rain gardens and conduct other tasks as necessary to reestablish rain gardens to requirements as indicated in the drawings and specifications.
- E. Verify that site grades have been built to elevations specified on grading plan prior to final restoration. If grades are not as specified, notify Owner immediately and correct grades accordingly.

3.19 QUALITY CONTROL

- A. General: Arrange for and assist the Geotechnical Consultant and Testing Agency as necessary to conduct required inspections and tests. Notify the Geotechnical Consultant and Testing Agency when fill, backfill, excavation and compaction processes commence for observation and testing. Do not proceed with further work until appropriate testing has been satisfactorily completed. Allow Geotechnical Consultant and Testing Agency to inspect and approve subgrades and fill layers before further work is performed.
- B. The following minimum representative tests, inspections, and related work are required.
 - 1. Mechanical analysis and classification (ASTM C136/C136M and ASTM D2487): Provide one representative test of each type of fill from each source, on-site and off-site, including base materials used below floors and pavements.
 - 2. Standard Proctor analysis (ASTM D698): Provide one representative test of each material from each source, on-site and off-site, and for subgrade soils.

3. Compaction (density) test (ASTM D1556/D1556M and ASTM D6938):
 - a. Wall Footings:
 - 1) 1 test per lift of fill per 50 lineal feet of fill placed below footings
 - 2) 1 test per 50 lineal feet of final footing subgrade
 - 3) 1 test per 2 vertical feet per 50 lineal feet of backfill placed against footings
 - 4) 1 test daily during filling
 - 5) Perform tests immediately prior to pouring footings.
 - b. Pavements:
 - 1) Streets (parking lots and development access roads):
 - (a) 1 test per lift of fill per 250 lineal feet
 - (b) 1 test for final pavement section subgrade per 250 lineal feet
 - (c) 1 test per lift of aggregate base per 250 lineal feet
 - 2) 1 test daily during filling or base construction
 - c. If nuclear methods are used, limit to 90 percent of the total test number, with location mixed such that correlation with sand cone method can be easily made.
4. Proof Rolling: In the presence of the Geotechnical Consultant and Testing Agency, proofroll the compacted subgrades in building and pavement areas as specified herein.
5. Topsoil:
 - a. Mechanical analysis and classification (ASTM C136/C136M and ASTM D2487): Provide two representative tests from each source, on-site and off-site.
 - b. Organic content: Provide two representative tests from each source, on-site and off-site.
 - c. pH: Provide two representative tests form each source, on-site and off-site.
- C. Coordinate inspections and testing with regulators (e.g., City).
- D. Re-Testing: If, based upon Geotechnical Consultant and Testing Agency reports and inspections, work does not meet specified requirements, remove work, replace and retest at no additional cost to the Owner.

END OF SECTION 31 0000

SECTION 32 1123
AGGREGATE BASE COURSE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aggregate base course.
- B. Paving aggregates.

1.02 REFERENCES

- A. ASTM D6938 - Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth); 2017.
- B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); 2012, with Editorial Revision (2015).

1.03 SUBMITTALS

- A. Samples: Submit 10 lb sample of each type of aggregate; submit in air-tight containers to testing laboratory.
- B. Materials Sources: Submit name of imported materials source.
- C. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- D. Compaction Density Test Reports.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Aggregate Base: Conforming to MnDOT 3138.2 Aggregate Base, Class 5.

2.02 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of aggregate materials.
- B. If tests indicate materials do not meet specified requirements, change material and retest.
- C. Provide materials of each type from same source throughout the Work. If source must change then retest at no cost to the Owner.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that survey benchmarks and intended elevations for the work are as indicated.
- B. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.02 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping and re-compacting.
- B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION

- A. Under Bituminous Concrete Paving:
 - 1. Place Aggregate Base to a total compacted thickness indicated on the plans.
 - 2. Place Aggregate Base with a moisture content within 1 percent below to 1 percent above its optimum moisture content.
 - 3. Compact to 100 percent of maximum dry density.
- B. Under Portland Cement Concrete Paving:
 - 1. Place Aggregate Base to a total compacted thickness indicated on the plans.
 - 2. Place Aggregate Base with a moisture content within 1 percent below to 1 percent above its optimum moisture content.

- 3. Compact to 100 percent of maximum dry density.
- C. Proof roll aggregate base material prior to placing bituminous or concrete pavement per Section 31 0000 - Earthwork.
- D. Place aggregate in maximum 4 inch lifts and compact to specified density.
- E. Level and contour surfaces to elevations and gradient indicated.
- F. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- G. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.04 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Scheduled Compacted Thickness: Within 1/4 inch.
- C. Variation From Design Elevation: Within 1/2 inch.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.
- B. Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D6938.
- C. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("Standard Proctor").
- D. If tests indicate work does not meet specified requirements, remove work, replace and retest.
- E. Frequency of Tests: Provide the minimum number of tests as follows, one test minimum.
 - 1. Exterior Paving and Similar Construction: One test for every 2,500 sq. ft. per 1 ft of depth of material placed or fraction thereof.
- F. Proof roll compacted aggregate at surfaces that will be under paving.

3.06 CLEANING

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION 32 1123

**SECTION 32 1200
BITUMINOUS PAVING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Section Includes:
- B. Quality control and quality assurance.
- C. Preparation and precautions.
- D. Traffic control and protections.
- E. Establishment of grade.
- F. Subgrade preparation and earthwork.
- G. Utility adjustments.
- H. Aggregate base.
- I. HMA paving.
- J. Reclaiming existing pavement and aggregate base for use as aggregate base.
- K. Tolerances.
- L. Tests and inspections.

1.02 REFERENCES

- A. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2014.
- B. ASTM D2172 - Standard Test Methods for Quantitative Extraction of Asphalt Binder from Asphalt Mixtures; 2017.
- C. ASTM D3549/D3549M - Standard Test Method for Thickness or Height of Compacted Asphalt Mixture Specimens; 2018.
- D. Minnesota Department of Transportation (MnDOT), Standard Specifications for Construction, 2018 edition.
- E. American Association of State and Highway Transportation Officials (AASHTO) tests equivalent to ASTM tests referenced above may be used in place of the ASTM tests.

1.03 DEFINITIONS AND ABBREVIATIONS

- A. Additive - Any material added to an asphalt mixture or material, such as mineral filler, asphalt additives, anti-strip, stabilizers, and similar products.
- B. Aggregate Base - A well graded granular material placed over a stable subgrade as an integral component of the pavement section and to provide a base on which the pavement is constructed.
- C. Asphalt Cement - A dark brown to black cementitious material in which the predominating constituents are bitumen's which occur in nature or are obtained in petroleum processing.
- D. Cold Mix Asphalt - Typically, a mixture of cutback asphalt and aggregate mixed in a plant which may be used immediately, or stockpiled for future use. Used for temporary repairs when HMA is unavailable due to seasonal constraints.
- E. Fine Aggregate (FA) - Fine aggregate as designated for use in pavement seal coats.
- F. Hot Mix Asphalt (HMA) - A high quality, thoroughly controlled hot mixture of asphalt cement and well graded, high quality mineral aggregate used to construct bituminous pavements.
- G. Lift - The maximum thickness of loose material that may be placed prior to compaction.

1.04 SUBMITTALS

- A. Test reports for testing as specified herein.

- B. Report(s) that summarize pertinent field observations and determinations of material suitability, construction methods and operations, detailed test reports for testing as specified herein, and other applicable testing as determined by LHB or Testing Agency during the course of construction.
- C. Documentation for the source of the materials incorporated in the Work.
- D. Job Mix Formula (JMF) for HMA prepared by an independent testing laboratory for acceptance. A JMF from a current project may also be acceptable. Engineer supplied mix designs and similar recommendations are not part of this specification. Provide and pay for all Work required to develop the JMF. Do not place the bituminous courses prior to acceptance of the JMF by the Owner.

1.05 QUALITY CONTROL AND QUALITY ASSURANCE

- A. Perform Work as specified herein and according to MnDOT requirements, except as modified herein. Where this specification differs from MnDOT requirements, the more stringent requirement governs.
- B. Equipment: Utilize equipment of proper size and in good working condition to prosecute the Work to full completion in a satisfactory manner.
- C. Personnel: Utilized experienced personnel familiar with the equipment, methods, and procedures for the job.
- D. Delivery, Storage, and Handling: Protect moisture sensitive materials against wetting by rain, snow, or ground moisture, and against intermixture with earth or other types of materials.
- E. Testing Agency:
 1. Responsibilities: The Testing Agency is responsible to inspect, test, and accept subgrades, material types and placement to determine their competency for support. Inspections, tests and frequencies are described in the "Tests and Inspections" article near the end of Part 3.
 2. Coordination: Coordinate construction activities and schedule the Testing Agency representative to perform field tests and inspections to assure compliance with this specification.

PART 2 PRODUCTS

2.01 AGGREGATE BASE

- A. Refer to Section 32 1123 - Aggregate Base Course

2.02 TACK COAT

- A. MnDOT standard specification section 2357.

2.03 HMA

- A. Bituminous Base Course: MnDOT standard specification section 2360, mixture designation SPWEA340C except as amended in the "Modifications" below. Asphalt content of mixture per result of job mix formula. Design asphalt content in accordance with current MnDOT standard.
- B. Bituminous Wear Course: MnDOT, standard specification section 2360, mixture designation SPWEA340C except as amended in the "Modifications" below. Asphalt content of mixture per result of job mix formula. Design asphalt content in accordance with current MnDOT standard.
- C. Recycled material may be used in the HMA according to MnDOT standard specification 2360/2350.

2.04 MNDOT MODIFICATIONS

- A. General modifications to MnDOT standard specifications are described in this article. Specific modifications are specified elsewhere in this specification.
- B. The Department is equivalent to LHB.
- C. The Engineer is equivalent to LHB.

- D. Material source approvals are not part of this specification. Provide material and mixture quality control data to the LHB affirming quality of materials specified as required in "Submittals" article herein.
- E. Sampling and testing as specified herein. Acceptance schedules are not part of this specification.
- F. Method of measurements and basis of payment as specified in contract documents.

PART 3 EXECUTION

3.01 PREPARATION & PRECAUTIONS

- A. Examination: Review slopes, elevations, grade, drainage, above and below grade utilities, and other conditions affecting the Work. Notify A/E of conditions which are unsatisfactory or detrimental to the proper and timely completion of the Work before starting Work. The start of Work constitutes that the Contractor is satisfied with the existing conditions.

3.02 ESTABLISHMENT OF GRADES

- A. Establish grades and set grade stakes as necessary to complete the Work.
- B. Grade paved areas uniformly to match surrounding existing pavement without awkward or abrupt transitions and to provide positive drainage free of puddling. Grade at a continuous positive slope of 2 percent (minimum) and 5 percent (maximum) to drainage provisions (e.g., curbs, catch basins, swales) to prevent puddles immediately after rain events. Additionally, do not allow standing water at pavement edges immediately after rain events for finished condition.

3.03 UTILITY ADJUSTMENTS

- A. Coordinate Work with existing or proposed utility surface features such as manhole and inlet rims, and valve boxes. Make adjustments, up or down, to these features so that finish grade of paving Work is flush with top of these features and to provide positive drainage of pavement. Make all adjustments prior to performing paving Work.
- B. Notify Engineer of discrepancies immediately and prior to performing Work.

3.04 AGGREGATE BASE

- A. Thickness for new paving: As shown on plans.

3.05 HMA PAVING

- A. Thickness for new paving: As shown on plans.
- B. Place the bituminous pavement in accordance with MnDOT standard specification section 2360.
- C. Provide a tack coat between lifts as specified herein.
- D. Maximum lifts: 2 inches.
- E. Minimum lifts (non-overlays): 1.5 inches
- F. Compaction for New Paving: Compact to an average of 92 percent of the maximum theoretical densities. No test shall exceed 97 percent nor fall below 89 percent. Perform rolling as soon as the hot mix material can be compacted without displacement. Continue rolling with consecutive passes to achieve even and smooth finish without roller marks.
- G. Small areas: For areas too small for a roller, compaction of bituminous pavement may be accomplished with vibrating plate compactor or hand tamper.

3.06 TACK COAT

- A. Perform Work according to MnDOT standard specification section 2357.

3.07 TOLERANCES

- A. Finish Grade Uniformity: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Variation from plan elevation (if applicable): Within 1/2 inch.

3.08 FIELD QUALITY CONTROL

- A. See Section 01 4500 - Quality Control for general requirements for quality control.

- B. Conduct compaction test of aggregate base course. per Section 32 1123 - Aggregate Base Course.
- C. Test bituminous thickness, density and asphalt content (per ASTM D2172 and ASTM C136/C136M) of bituminous at 100 feet on center.
 - 1. On-site: Make at least one field density test for every 2,000 sq. ft. or maximum 100 feet on center of paved area.
- D. Testing Rolling: Under the direction of the Geotechnical Engineer, test roll with a fully loaded tandem axle truck following placement of aggregate base, but prior to placing bituminous. Maximum acceptable deflection is .05'. Surface smoothness shall be within 1/4 inch of a 10 foot straight edge applied parallel with and at right angles to the center line of paved areas.
- E. Thickness: In-place compacted thickness will be determined according to ASTM D3549/D3549M and will not be acceptable if exceeding the following allowable variation from required thickness:
 - 1. Base Course: 1/2 inch, plus, no minus.
 - 2. Surface Course: 1/4 inch, plus, no minus.
 - 3. Design thickness on drawings is minimum allowable thickness for the asphalt section.
- F. Surface Smoothness: Test finished surface of each asphalt concrete course smoothness, using 10' straightedge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness.
 - 1. Base Course Surface: 1/4 inch.
 - 2. Wearing Course Surface: 3/16 inch.
 - 3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template 1/4 inch.

END OF SECTION 32 1200

**SECTION 32 1313
CONCRETE PAVING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Concrete patio slabs, courts, sidewalks, integral curbs, and gutters.

1.02 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- B. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).
- C. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.
- D. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
- E. ASTM A743/A743M - Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application; 2017.
- F. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2012.
- G. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method; 2017A.
- H. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2018b.
- I. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.
- J. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
- K. ASTM C150/C150M - Standard Specification for Portland Cement; 2015.
- L. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- M. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- N. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements; 2015.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on joint filler and curing compound.

PART 2 PRODUCTS

2.01 FORM MATERIALS

- A. Form Materials: Comply with ACI 301.
- B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
 - 1. Thickness: 1/2 inch.

2.02 REINFORCEMENT

- A. Steel Welded Wire Reinforcement: Plain type, ASTM A1064/A1064M; in flat sheets; unfinished.
- B. WWM: Steel Welded Wire Reinforcement in Sidewalks: ASTM A1064/A1064M; in flat sheets; epoxy coated finish. Size: 6 inch x 6 inch.

2.03 CONCRETE MATERIALS

- A. Concrete materials: Conform to MnDOT 2521 for walks, patios, and pavement and MnDOT 2531 for curb and gutters, as modified below:
 - 1. Maximum water-cementitious materials ratio at point of placement: 0.45
 - 2. Air Content: 5 to 7 percent.
- B. Cement: ASTM C150/C150M, Normal - Type I Portland cement, gray color.

2.04 ACCESSORIES

- A. Curing Compound: ASTM C309, Type 1, Class A.
- B. Liquid Surface Sealer: Cureseal S clear sealer by Scofield or equal.
- C. Tactile Warning Surfaces:
 - 1. Truncated Dome Panels:
 - a. East Jordan Iron Works – Cast Iron Uncoated.
 - b. Neenah Foundry Company – Cast Iron Uncoated.
- D. Joint Sealer: Rubber asphalt joint sealer. ASTM D6690.

2.05 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.02 SUBBASE

- A. See Section 32 1123 - Aggregate Base Course for construction of base course for work of this Section.

3.03 PREPARATION

- A. Moisten base to minimize absorption of water from fresh concrete.

3.04 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.05 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. All exterior walks and slabs on grade shall be 4 inches or 8 inches thick, as shown on drawings. See plans for locations. Apply acrylic curing and sealing compound in accordance with manufacturer's instructions.
- C. All curb and gutter profiles shall be MnDOT Design B612.

3.06 JOINTS

- A. Align curb, gutter, and sidewalk joints.

- B. Place 3/8 inch wide expansion joints at 20 foot intervals and where exterior slabs on grade abut curbs, structures, walks, walls and other fixed objects.
 - 1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
- C. Provide scored joints at 5 foot on center in both directions in walks unless otherwise noted on the plans.

3.07 FINISHING

- A. Area Paving: Light broom, texture perpendicular to pavement direction.
- B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with 2" smooth troweled and radiused edge 1/4 inch radius.
- C. Curbs and Gutters: Light broom, texture parallel to pavement direction.
- D. Inclined Vehicular Ramps: Broomed perpendicular to slope.
- E. Place sealer on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.08 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- B. Maximum Variation From True Position: 1/4 inch.

3.09 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4500 - Quality Control.
 - 1. Provide free access to concrete operations at project site and cooperate with appointed firm.
- B. Compressive Strength Tests: ASTM C39/C39M; for each test, mold and cure three concrete test cylinders. Obtain test samples for every 75 cu yd or less of each class of concrete placed.
- C. The following minimum representative tests, inspections, and related work are required.
 - 1. Sampling Fresh Concrete: Per ASTM A743/A743M, except modified for slump to comply with ASTM C94/C94M.
 - 2. Slump: Per ASTM C143/C143M; provide one test at point of discharge for each day's pour of each type of concrete and one additional test when concrete consistency seems to have changed. Provide minimum of one test for every 100 cubic yards or 1,000 lineal feet of curb and gutter.
 - 3. Air Content: Per ASTM C231 pressure method for normal weight concrete; provide one test for each day's pour for each type of air-entrained concrete. Provide one test at point of discharge for each day's pour of each type of concrete and one additional test when concrete consistency seems to have changed. Provide minimum of one test for every 100 cubic yards or 1,000 lineal feet of curb and gutter.
 - 4. Concrete Temperature: Test hourly when air temperature is 40 degrees F and below, and when 80 degrees F and above; and each time a set of compression test specimens made.
 - 5. Compression Test Specimen: Per ASTM C31/C31M; provide one set of 3 standard cylinders for each compressive strength test. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
 - 6. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 75 cu yd or less of each class of concrete placed.

3.10 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.

END OF SECTION 32 1313

SECTION 32 1440
STONE PAVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Salvaged granite paver.
- B. Sand bed materials.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.03 MOCK-UP

- A. Provide paver mock-up, 4 feet long by 4 feet wide to be approved by Landscape Architect. Mock-up paving pattern shall match existing stone pavers at main entry.
- B. Locate at stone patio as shown on plan.

1.04 FIELD CONDITIONS

- A. Maintain cementitious materials and substrate surface to a minimum of 50 degrees F prior to, during, and 48 hours after completion of work.

PART 2 PRODUCTS

2.01 PAVER MATERIALS

- A. Salvaged Granite Pavers: Salvaged stone veneer, size similar to pavers at front walk, from building demolition. See architectural plans.; ____ by ____ inch size, ____ inch thick; _____ shape, _____ surface finish; _____ color

2.02 SAND BED MATERIALS

- A. Sand for Base and Joints: Clean washed bank sand containing maximum of 30 percent particle size of No. 10 (2 mm) sieve.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate is level, smooth, capable of supporting pavers and imposed loads, and ready to receive work of this section.
- B. Verify gradients and elevations of substrate are correct.

3.02 INSTALLATION - SAND SETTING BED

- A. Spread sand evenly over prepared substrate to a maximum thickness of 1-1/2 inch.
- B. Dampen and roller compact sand to level and even surface.
- C. Screed and scarify top 1/2 inch of sand.
- D. Place paver units in herringbone pattern, from straight reference edge.
- E. Sprinkle sand over surface, sweep into joints and moisten. Recover with additional sand until firm joints are achieved. Remove excess sand.
- F. Tamp and level paver units with mechanical vibrator until units are firmly bedded, level, and to correct elevation and gradients.

3.03 CLEANING

3.04 PROTECTION

- A. Do not permit traffic over unprotected paver surface.
- B. Touch-up, repair or replace damage products before Substantial Completion.

END OF SECTION 32 1440

SECTION 32 3216
PRECAST MODULAR BLOCK RETAINING WALL

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Furnishing materials and labor required for the design and construction of a ReCon precast modular block retaining wall.

1.02 REFERENCES

- A. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete; 2014a.
- B. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
- C. ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading; 2011 (Reapproved 2018).
- D. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2016.
- E. ReCon Construction Detail Drawings: www.reconwalls.com

1.03 DEFINITIONS

- A. ReCon Retaining Wall Unit: Concrete, modular facing block provided by an authorized manufacturer under license to ReCon Retaining Wall Systems, Inc.
- B. Geogrid: A geosynthetic material manufactured of high tensile materials specifically for the purpose of reinforcing and creating a structural soil mass.
- C. Drainage Aggregate: Clean, crushed rock located within and immediately behind ReCon units to facilitate drainage and avoid compaction in close proximity to ReCon wall units.
- D. Reinforced Soil: Soil zone extending from the Drainage aggregate zone to the back of the embedded geogrid.
- E. Foundation Soil: Soil zone immediately beneath the retaining wall facing units, the wall leveling pad and the reinforced soil zone.
- F. Retained Soil: Soil immediately behind retaining wall facing and drainage aggregate for modular gravity structures or behind the reinforced soil for wall that utilize geogrid.
- G. Construction Drawings: Approved final plan for construction prepared and stamped by the wall design engineer licensed to practice in the state where the retaining wall is located.

1.04 SUBMITTALS

- A. Contractor shall submit Manufacturer's product data and installation instructions for approval.
- B. Contractor shall submit Manufacturer's test reports certifying that the ReCon units manufactured at their production facility meet the requirements of this specification and the requirements of the Construction Drawings.
- C. Unless provided within these project documents and/or the project drawings, contractor shall submit two sets of the Construction Drawings for all ReCon retaining walls on the project.
 - 1. The design shall be prepared by a Professional Engineer licensed to practice in the state where the retaining wall is located.
 - 2. The design shall be per NCMA Design Guidelines for Segmental Retaining Walls, or the AASHTO Standard Specifications for Highway Bridges, whichever is applicable as determined by the retaining wall design engineer.
 - 3. Construction Drawings shall include:
 - a. The retaining wall layout and retaining wall heights.
 - b. Proper placement, lengths and types of geogrid reinforcement where necessary.
 - c. Typical wall sections.
 - d. Types, locations and properties of all drainage materials, appurtenances and special installation requirements not covered in this specification.
 - e. Retaining wall elevation views.

- f. Any soils information or testing conducted in addition to that included within the project drawings and specifications.
 - g. Design assumptions.
- D. If geogrid reinforcement is required in the final engineered construction drawings, submit manufacturer's product literature, product testing reports and a twelve inch or larger sample of each type to be used in wall construction.
 - E. Submit gradation reports for aggregates used for the wall leveling pad, unit / drainage fill and for select reinforced fill if required in the final engineered wall design.
 - F. All submittals must be provided and reviewed prior to the start of retaining wall construction.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall inspect all products at delivery to determine that the proper materials have been delivered and are usable. Damaged material shall not be incorporated into the work.
- B. ReCon retaining wall units shall be stored in a location and manner that protects against excessive weathering and damage.
- C. Contractor shall prevent ReCon units from excessive soiling and coming in contact with substances which may stain or adhere to the finished visual surfaces of the unit.
- D. Faces of the ReCon Block shall be free of excessive chipping, cracking and stains.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Contractor shall have successfully installed at least three projects similar to that of this project within the last two years. Contractor shall maintain at least one mechanic on site at all times that worked on one or more of these previous installations.
- B. Owner shall employ the services of an independent geotechnical or materials engineering firm to provide soil testing and quality assurance inspection for wall construction and soils work. Contractor shall provide any quality control testing or inspection not provided by the Owner.
- C. Retaining Wall Design Engineer Qualifications: The Retaining Wall Design Engineer shall be licensed to practice in the state in which the project located. Additionally, the Retaining Wall Design Engineer shall be independently capable of performing all retaining wall analysis calculations (internal and external stability, seismic analysis, water analysis, and global stability) and have designed at least three wall projects similar to that of this project.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Only licensed and authorized manufacturers of:
 - 1. ReCon Wall Systems, Inc.
7600 West 27th St., #229
St Louis Park, MN 55426
(952) 922-0027 Phone
(952) 922-0028 Fax
www.reconwalls.com

2.02 MATERIALS

- A. ReCon retaining wall units.
 - 1. The block unit shall consist of concrete with the average 28-day compressive strength of no less than 4000 psi.
 - 2. Concrete shall have air entrainment by volume (as measured in the plastic state in accordance with ASTM C172/C172M) of:
 - a. 5.5 - 8.5 percent, or
 - b. In conformity with ASTM C94/C94M, latest revision.
 - 3. Exterior dimensions of the face shall be 48-inches by 16-inches for full and corner unit, and 24-inches by 16-inches for half unit.
 - 4. Depth of unit should be as per Construction Drawings and is available in depths from 24-inches up to 84-inches (dimensions in inches: 24, 39, 45, 60, 66, 72, 78, 84).

5. ReCon Units used shall maintain tolerances of:
 - a. Height: +/- 3/16-inch
 - b. Width: +/- 1/2-inch unless field cut for fitting purposes.
 - c. Depth: No less than the unit design depth (i.e. 24-inch, 39-inch, etc.) with the textured face portion of the block is considered as 4-inches
6. Special shape units should be obtained and used where indicated on the final engineered construction drawings. Reference ReCon Drawing #101 for overview of standard unit types.
 - a. ReCon Unit Face Texture Shall be "Old World"
- B. Geogrid Reinforcement: Geosynthetic reinforcement shall be high tensile geogrid or geotextile manufactured specifically for soil reinforcement applications.
 1. Construction Drawings shall indicate the type, strength, location and lengths of reinforcement used.
 2. The geosynthetic manufacturer shall provide all relevant testing to the wall design engineer for incorporation in the wall design and shall be included in the submittal for the Construction Drawings.
 3. No substitutions of geosynthetic shall be allowed that was not evaluated in the Construction Drawings.
- C. Base Leveling Pad: The wall base leveling pad material shall consist of a compacted crushed stone base or non-reinforced concrete as indicated in the Construction Drawings.
- D. Drainage Aggregate: Drainage aggregate shall consist of clean 3/4" crushed stone or gravel meeting the requirements of the Construction Drawings.
- E. Reinforced Soil: All reinforced soil, borrow or imported, shall meet all requirements of the Construction Drawings. Reinforced soils, by gradation, shall have no more than 35 percent passing the number 200 sieve for walls less than 20-feet in height and no more than 15 percent passing the number 200 sieve for walls greater than 20-feet in height.
- F. Drainage Pipe: If required in Construction Drawings, drainage pipe shall be perforated or slotted PVC pipe manufactured in accordance with ASTM D3034 or ASTM D2412. Drainage pipe may also be covered with a geotextile filter fabric.
- G. Unit Adhesive: Adhesive shall be a premium, construction grade suitable for concrete and exterior applications.

2.03 FINISHES

- A. ReCon retaining wall color
 1. Finished wall shall be left in natural (as-cast) color.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify locations of utilities and existing structures prior to excavation.
- B. Examine the Project site and evaluate conditions where the ReCon retaining wall will be constructed. Notify the proper supervising authority in writing of any conditions that may interfere with the proper construction of the ReCon wall or delay completion.
- C. Promptly notify the wall design engineer of site conditions which may affect wall performance, soil conditions observed other than those assumed, or other conditions that may require a reevaluation of the wall design.

3.02 EXCAVATION

- A. Contractor shall excavate to the lines and grades shown on the construction drawings. The contractor shall be careful not to disturb the base beyond the lines indicated.
- B. Foundation soils shall be excavated as required for footing base / leveling pad dimensions shown on the construction drawings, or as directed by the wall engineer.
- C. The contractor shall provide temporary shoring of the wall excavation area as needed to limit the excavation within the project site property boundaries.

- D. Over-excavated areas shall be filled with suitable base or backfill material and compacted to 95 percent standard proctor.

3.03 FOUNDATION SOILS PREPARATION

- A. Foundation soils shall be evaluated by a Geotechnical Engineer or Owners Representative to ensure that the bearing soils meet or exceed the design conditions or assumptions.
- B. Compact foundation soil zone to 95 percent standard proctor prior to installing base / leveling pad.

3.04 BASE / LEVELING PAD

- A. Base shall be located as indicated on the Construction Drawings and shall have a minimum thickness of 6-inches. Base materials are to be as specified by the wall engineer (generally crushed stone, 3/4-inch minus, or similar).
- B. Width of the base pad must extend a minimum of 6-inches in front and 6-inches in back of the ReCon Base Block footprint.
- C. Base material shall be compacted so as to provide a smooth, hard surface on which to place the first course of units.
- D. Compact base material to 95 percent of standard proctor.
- E. Base shall be prepared to ensure full contact of the wall unit with base material. Spacing or gaps between units shall no exceed 1/2-inch.
- F. Contractor may elect to substitute a portion of the specified granular base materials with a lean, unreinforced concrete topping.
- G. When a reinforced footing is required by the Construction Drawings, it shall be located below the frost line.

3.05 UNIT INSTALLATION

- A. First course of units shall be Base Block units and shall be placed in full contact with the base material.
- B. Check units for level from side-to-side, front to back, and check to maintain unit batter front-to-back.
- C. Place unit faces in contact side to side and avoid any gaps greater than 1/2-inch.
- D. Fill and compact fill to grade in front of embedded units prior to compaction behind the wall units.
- E. Fill voids between ReCon units with 3/4-inch clean crushed rock to a distance of one foot behind the unit depth unless otherwise instructed in the Construction Drawings.
- F. Sweep and clean the top of each course before setting additional courses.
- G. Lay each successive course making sure that the bottom recess is in full contact with the unit locators of the course below. Pull unit forward as far as possible. Backfill and compact soil behind the units.
- H. Check and maintain level and wall batter by use of shims when necessary.
- I. Follow ReCon recommended procedures to maintain acceptable running bond when constructing curved walls and / or corners. Build in accordance with Construction Drawings or ReCon Construction Detail Drawings.
- J. Handle units with proper lifting devices that have been certified for the loads associated with the weights of the units. Avoid applying forces to the lifting loops in excess of the normal force associated with the weight of the unit (i.e., avoid dynamic loads from bouncing or swinging of a unit). If the unit is to be transported over a significant distance in the field, it is recommended that a CABLE be used in lieu of a chain.

3.06 GEOGRID INSTALLATION

- A. Install geosynthetic reinforcement in accordance with manufacturer's recommendations and the Construction Drawings.
- B. Locate geosynthetic reinforcement at elevations and to the lengths shown on the Construction Drawings.
- C. Prior to installation of geosynthetic reinforcement, level and compact backfill material to the level of the reinforcement layer.
- D. Reinforcement design strength direction must be oriented perpendicular to wall face.
- E. Position reinforcement on ReCon units over the tongue and groove and to within 2-inches of the front exposed face. The next course of units shall be placed such that the geogrid is deformed over the tongue and groove. The next course of units must be slid forward such that the back edge of the groove on this unit is up against the back edge of the tongue on the lower unit with the geogrid pinched between the tongue and groove. Hold in place by installing the next course of units.
- F. Remove all wrinkles or folds in reinforcement by pulling taut prior to backfill placement. Secure using soil staples, stakes or hand tension until reinforcement is covered with sufficient fill to maintain tensioned position.
- G. Reinforcement shall be continuous throughout the embedment length. Splicing along reinforcement strength direction is not allowed.
- H. Position reinforcement sections side-by-side to provide 100 percent coverage along wall face.
- I. Where curved wall sections cause overlap areas in reinforcement, maintain at least 3-inches of soil between layers where overlap occurs.

3.07 REINFORCED BACKFILL PLACEMENT

- A. Wall fill material shall be placed in lifts no greater than 8-inches in depth and shall be less if necessary to achieve necessary compaction.
- B. Compact backfill material to 95 percent of standard proctor.
- C. Only hand-operated compaction equipment shall be used within 3-feet of the back of the ReCon unit. Heavy-duty compaction equipment should be kept a minimum of 5-feet from the back of the ReCon unit to avoid wall rotation.
- D. Wherever possible, backfill should be placed beginning at the face of the wall. Backfill shall be placed, spread, and compacted in a manner that minimizes the development of wrinkles, folds or movement of geogrid.
- E. Tracked construction equipment shall not be operated directly on the geogrid. A minimum backfill thickness of 6-inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
- F. Rubber tired equipment may pass over the geogrid reinforcement at slow speeds, (less than 10 MPH). Avoid sudden braking and sharp turning.
- G. At the conclusion of each day's work, slope backfill at both the crest and bottom of wall away from wall face to prevent surface drainage from scouring or ponding.
- H. During wall construction, the General Contractor shall be responsible for coordination of other project site operations so as to avoid adjacent construction site drainage from affecting wall construction area.
- I. Upon completion of wall construction work, the General Contractor shall:
 - 1. Ensure finished grading directs normal drainage away from the finished wall.
 - 2. Ensure other trades do not operate heavy equipment or excavate near the wall and reinforced soil zone.

3.08 OTHER CONSTRUCTION DETAILS

- A. ReCon provides a number of Construction Detail Drawings (see Section 1.2F) which can be found on ReCon's website (www.reconwalls.com) and should be referred to for guidance on wall specific applications.

3.09 SITE TOLERANCES

- A. Straight walls
 - 1. Vertical Alignment: +/- 1.5-inches over any 12-foot distance and no more than +/- 3-inches over the entire length of wall.
- B. Horizontal Alignment Control:
 - 1. Corners and radius location: +/- 1-foot to theoretical location indicated on the Grading Plan.
 - 2. Radii: +/- 2-feet from theoretical lines indicated on the Grading Plan.
- C. Wall Batter at Completion of Work: +/- 2-degrees from the design batter and no batter less than 2-degrees.

3.10 FIELD QUALITY CONTROL

- A. Contractor shall be responsible for proper installation and quality control of all ReCon wall components and appurtenant materials.
- B. Owner shall, at their expense, retain a qualified professional to monitor and perform quality assurance checks of the installer's work.
- C. Quality Assurance should include foundation soil inspection, frequent backfill compaction testing, verification of geotechnical design parameters and compliance with Construction Drawings and Project Specifications.

3.11 CLEANING

- A. After completion of wall installation, remove construction debris and restore any adjacent finished areas affected by wall construction to their pre-construction state.
- B. Wash wall face to remove soiling and stains. Do not use acid or detergents that may "burn" or discolor face.

END OF SECTION 32 3216

**SECTION 32 3300
SITE FURNISHINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tables.
- B. Trash receptacles.

1.02 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's specifications and descriptive literature, installation instructions, and maintenance information.

1.04 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturer's warranty against defects in materials or workmanship for a period of 5 years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Tables:
 - 1. Carousel Tables by Landscape Forms or approved equal: Dining height table, backed, perforated 3 seats, catena powdercoat black tabletop, freestanding.
 - a. Landscape Forms; www.landscapeforms.com
- B. Trash receptacles:
 - 1. Chase Park Litter by Landscape Forms or approved equal: 24" x 39," Side open, keyed lock, black, freestanding with weighted base.
 - a. Landscape Forms; www.landscapeforms.com

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that mounting surfaces, preinstalled anchor bolts, or other mounting devices are properly installed; and ready to receive site furnishing items.

3.02 INSTALLATION

- A. Install site furnishings in accordance with approved shop drawings, and manufacturer's installation instructions.

END OF SECTION 32 3300

SECTION 32 9219

SEEDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Preparation of subsoil.
- B. Placing topsoil.
- C. Seeding, mulching and fertilizer.
- D. Maintenance.

1.02 DEFINITIONS

- A. Weeds: Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.03 SUBMITTALS

- A. Maintenance Data: Include maintenance instructions, cutting method and maximum grass height; types, application frequency, and recommended coverage of fertilizer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable. Deliver seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2 PRODUCTS

2.01 SEED MIXTURE

- A. Seed Mixture:
 - 1. Turf Seed
 - a. Sunny & Shady Mixture by Turf Science Genetics (TSG) or approved equal.
www.turfsciencegenetics.com

2.02 SOIL MATERIALS

- A. Topsoil: See Earthwork, Section 31 0000

2.03 ACCESSORIES

- A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.
- B. Fertilizer: 10-20-20; recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated by analysis.
- C. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared soil base is ready to receive the work of this Section.

3.02 PREPARATION

- A. Prepare subgrade and topsoil in accordance with Section 31 0000

3.03 FERTILIZING

- A. Apply fertilizer in accordance with manufacturer's instructions.

- B. Apply after smooth raking of topsoil and prior to roller compaction.
- C. Do not apply fertilizer at same time or with same machine as will be used to apply seed.
- D. Mix thoroughly into upper 2 inches of topsoil.
- E. Lightly water to aid the dissipation of fertilizer.

3.04 SEEDING

- A. Apply seed at rate recommended by seed manufacturer. Apply evenly in two intersecting directions. Rake in lightly.
- B. Do not seed areas in excess of that which can be mulched on same day.
- C. Do not sow immediately following rain, when ground is too dry, or during windy periods.
- D. Immediately following seeding and compacting, apply mulch to a thickness of 1/8 inches. Maintain clear of shrubs and trees.
- E. Apply water with a fine spray immediately after each area has been mulched. Saturate to 4 inches of soil.
- F. Following germination, immediately re-seed areas without germinated seeds that are larger than 4 by 4 inches.

3.05 PROTECTION

- A. Identify seeded areas with stakes and string around area periphery. Set string height to 24 inches. Space stakes at 48 inches.

3.06 MAINTENANCE

- A. Provide maintenance at no extra cost to Owner until occupancy; Owner will pay for water.
- B. See Section 01 7000 - Execution Requirements, for additional requirements relating to maintenance service.
- C. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.
- D. Neatly trim edges and hand clip where necessary.
- E. Immediately remove clippings after mowing and trimming.
- F. Provide a separate maintenance contract for watering sod and plants for one growing season.
- G. Roll surface to remove minor depressions or irregularities.
- H. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.
- I. Immediately reseed areas that show bare spots.
- J. Protect seeded areas with warning signs during maintenance period.
- K. Provide a separate maintenance contract for watering sod, seed, and plants for one growing season.

END OF SECTION 32 9219

SECTION 32 9223

SODDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Placing topsoil.
- B. Fertilizing.
- C. Sod installation.
- D. Maintenance.

1.02 DEFINITIONS

- A. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.03 REFERENCE STANDARDS

- A. TPI (SPEC) - Guideline Specifications to Turfgrass Sodding; 2006.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Certificate: Certify grass species and location of sod source.

1.05 QUALITY ASSURANCE

- A. Sod Producer: Company specializing in sod production and harvesting with minimum five years experience, and certified by the State of Minnesota.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sod on pallets. Protect exposed roots from dehydration.
- B. Do not deliver more sod than can be laid within 24 hours.

1.07 MAINTENANCE

- A. Provide a separate maintenance contract for watering sod, seed, and plants for one growing season.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Sod: TPI (SPEC), Certified Turfgrass Sod quality; cultivated grass sod; type indicated below; with strong fibrous root system, free of stones, burned or bare spots; containing no more than 5 weeds per 1000 sq ft. Minimum age of 18 months, with root development that will support its own weight without tearing, when suspended vertically by holding the upper two corners.
 - 1. Kentucky Blue Grass Type: 80 percent.
 - 2. Perennial Rye Grass Type: 20 percent.
- B. Water: Clean, fresh and free of substances or matter that could inhibit vigorous growth of grass.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared soil base is ready to receive the work of this section.

3.02 PREPARATION

- A. Place topsoil in accordance with Section 31 0000

3.03 LAYING SOD

- A. Moisten prepared surface immediately prior to laying sod.

- B. Lay sod immediately after delivery to site to prevent deterioration.
- C. Lay sod smooth and tight with no open joints visible, and no overlapping; stagger end joints 12 inches minimum. Do not stretch or overlap sod pieces.
- D. Where sod is placed adjacent to hard surfaces, such as curbs, pavements, etc., place top elevation of sod 1/2 inch below top of hard surface.
- E. Water sodded areas immediately after installation. Saturate sod to 4 inches of soil.
- F. After sod and soil have dried, roll sodded areas to ensure good bond between sod and soil and to remove minor depressions and irregularities. Roll sodded areas with roller not exceeding 100 lbs.

3.04 MAINTENANCE

- A. Provide maintenance at no extra cost to Owner until occupancy; Owner will pay for water.
- B. Mow grass at regular intervals to maintain at a maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at any one mowing.
- C. Neatly trim edges and hand clip where necessary.
- D. Immediately remove clippings after mowing and trimming.
- E. Water to prevent grass and soil from drying out.
- F. Roll surface to remove irregularities.
- G. Control growth of weeds. Apply herbicides in accordance with manufacturer's instructions. Remedy damage resulting from improper use of herbicides.
- H. Immediately replace sod to areas that show deterioration or bare spots.
- I. Protect sodded areas with warning signs during maintenance period.
- J. Provide a separate maintenance contract for watering sod, seed, and plants for one growing season.

END OF SECTION 32 9223

SECTION 32 9300

PLANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Scope includes new trees, plants, and groundcover and associated work:
 - 1. Excavation below grade for trees and shrubs.
 - 2. Planting soil.
 - 3. The furnishing, planting, wrapping and pruning of plant materials.
 - 4. Fertilizing.
 - 5. Edging.
 - 6. Mulching.
 - 7. Clean-up.

1.02 REFERENCE STANDARDS

- A. Minnesota Department of Transportation, Standard Specifications for Construction, 2000 Edition.
- B. ANSI/AHIA Z60.1 - American National Standard for Nursery Stock; 2014.
- C. ANSI A300 Part 1 - American National Standard for Tree Care Operations -- Tree, Shrub and Other Woody Plant Maintenance -- Standard Practices; 2017.
- D. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 1999a (Reapproved 2014).
- E. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a.
- F. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile; 2012.

1.03 SUBMITTALS

- A. See Section 01 3323 - Shop Drawings, Product Data and Samples for administrative requirements for submittal procedures.
- B. Plant installation schedule: Plant installation schedule shall be submitted a minimum of 30 days before beginning plant installation. Schedule shall specify planting season (spring or fall), dates, locations, and plant materials to be installed. Once accepted, revise only as approved in writing, after documentation of reasons for delays.
- C. Substitutions will not be permitted. If proof is submitted that any plant specified is not obtainable, a written proposal will be considered for use of the nearest equivalent size or variety with an equitable adjustment of contract price.

1.04 QUALITY ASSURANCE

- A. Codes: Plant materials shall comply with local, state and federal laws relating to inspection for diseases and insect infestation.
- B. Grading Standards: Plant stock shall conform to the code of standards set forth in the current edition of American Standards for Nursery Stock (ANSI).
- C. Plant Names and Labels: The nomenclature used in the Drawings and Specifications conforms, with few exceptions, to that of the current edition of Standardized Plant Names as adopted by the American Joint Committee on Horticultural Nomenclature.
- D. Workmen: Landscaping work shall be performed under the supervision of a qualified planting foreman.
- E. Labeling: Label at least one tree and one shrub per shrub bed of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name.
- F. Inspection: The Landscape Architect may inspect trees and shrubs (at place of growth or at site before planting) for compliance with requirements for genus, species, variety, size and quality.

Landscape Architect retains right to further inspect trees and shrubs for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from project site.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Notify Landscape Architect in advance of delivery of trees, shrubs and other plant material and manner of shipment. Furnish itemized list of actual quantity and sizes.
- B. When shipment of plant material is made by truck, pack to provide adequate protection against climate and breakage during transit and tie to prevent whipping. Cover tops to prevent damage.
- C. Deliver all packaged material in original, undamaged containers. Packaging to clearly identify manufacturer, brand, name, analysis of contents and net weight.
- D. Deliver plant material direct from nursery. Heel-in immediately upon delivery if not to be planted within four hours, covering with moist soil, mulch or other approved medium to protect from drying. Store plants in shade and protect from weather.
- E. Do not drop plant materials or pick up balled plants by stems or trunks.
- F. Handle packaged materials in such a manner as to prevent contamination or spillage.
- G. No plant shall be bound with wire or rope so as to damage the bark or spread of the branches.
- H. If required by Landscape Architect, apply anti-desiccant using power spray to provide an adequate film over trunks, branches, stems, twigs and foliage. If deciduous trees or shrubs are moved in full-leaf, spray with anti-desiccant at nursery before moving and again 2 weeks after planting. Spray coniferous plants that are planted in the fall.
- I. All materials used for balled and burlapped plants shall be natural (non-synthetic) and biodegradable. Wire baskets shall not be galvanized.
- J. All plant materials shall be assembled in one location on the job site to permit inspection and approval by the Landscape Architect. Stock with broken root balls or loose containers, and stock which shows evidence of being root bound, overgrown or recently canned, or damaged, shall be removed from the site immediately and replaced at the Contractor's expense with another plant meeting the original Specifications.
- K. Dig balled and burlapped (B&B) plants with firm natural balls of earth of sufficient diameter and depth to include all fibrous and feeding roots. No plants moved with a ball will be accepted if the ball is cracked or broken before or during planting operations.
- L. Roots or balls of plants shall be adequately protected at all times from sun and drying winds.
- M. All balled and burlapped plants which cannot be planted immediately upon delivery shall be set on the ground and shall be well protected with soil, wet moss, or other acceptable material. Bare rooted plants which cannot be planted immediately shall be protected with soil, wet moss or heeled in trenches immediately upon delivery.

1.06 JOB CONDITIONS

- A. Proceed with the complete landscape work as rapidly as portions of site become available, working within seasonal limitations.
- B. Utilities: Call Gopher State One Call and locate all other underground utilities. Perform work in a manner which will avoid possible damage. Notify Landscape Architect if conflict exists before excavating planting pits. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by both parties concerned.
- C. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before planting.
- D. Planting options shall be conducted under favorable weather conditions during either the Spring planting season, from time ground has thawed to June 1, or the Fall planting season, August 21 until November 15. During the Fall planting season coniferous material planting shall be conducted August 21 to October 1. Coordinate planting with specified maintenance periods to

provide maintenance up to date of Owner's acceptance. Contractor may elect to plant in off seasons at his/her own risk.

- E. Coordination with Lawns: Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to Landscape Architect. If planting of trees and shrubs occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.
- F. Nursery Qualifications: Company specializing in growing and cultivating the plants with three years documented experience.

1.07 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in installing and planting the plants with three years experience.

1.08 FIELD CONDITIONS

- A. Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F.
- B. Do not install plant life when wind velocity exceeds 30 mph.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide one year warranty.
- C. Warranty: Include coverage for one continuous growing season; replace dead or unhealthy plants.
- D. Replacements: Plants of same size and species as specified, planted in the next growing season, with a new warranty commencing on date of replacement.

PART 2 PRODUCTS

2.01 PLANTING MATERIALS

- A. Deciduous Trees: Provide balled and burlapped (B & B) deciduous trees of height and caliper listed on the plant schedule or shown and with branching configuration recommended by ANSI Z60.1 for type and species required. Provide single stem trees except where special forms are shown or listed.
- B. Deciduous Shrubs & Perennial: Provide potted shrubs and perennials of the height shown or listed on the plant schedule and with not less than minimum number of canes required by ANSI Z60.1 for type and height of shrub required.
- C. Coniferous and Broad-Leafed Evergreens: Provide balled and burlapped evergreens of sizes shown or listed. on the plant schedule. Dimensions indicate minimum spread for spreading and semi-spreading type evergreens and height for other types, such as globe, dwarf, cone, pyramidal, broad up-right, and columnar. Provide normal quality evergreens with well-balanced form complying with requirements for other size relationships to the primary dimension shown.

2.02 LANDSCAPE MATERIALS

- A. Stakes and Braces: Wood stakes and braces shall be common lumber of the sizes in the following table:
 - 1. Tree Size Brace Stakes Guy Stakes
 - 2. 1" - 3-1/2"2" X 2" X 9'-0"2" X 2" X 2'-0"
- B. Guy Wires: Guy wires shall be a good commercial quality of galvanized wire. Wire used to guy trees up to four inches shall be No. 12 gauge; wire used to guy trees four inches and over shall be No. 9 gauge.
- C. Webbing: Shall be 3" wide nylon with grommets or 16" long polypropylene or polyethylene 40 mil. 3" wide straps. Requests for standard hose and wire guying systems will not be approved. See detail.

- D. Tree Wrapping Material: Material shall be first quality four inch wide rolls of bituminous impregnated tape, corrugated or crepe paper, specifically manufactured for tree wrapping, and having qualities to resist insect infestation.
- E. Weed Control Fabric: Minimum permittivity: 5 min. G per second:
 - 1. Minimum grab tensile strength in either direction: 100 lbs. (ASTM D4632/D4632M).
 - 2. Minimum seam breaking strength 90 lbs. (ASTM D4632/D4632M).
 - 3. Maximum apparent opening size: 50 (ASTM D4751).
 - 4. Minimum permittivity: 0.5 minimum g per second (falling head ASTM D4491).
- F. Double Shredded Hardwood Mulch: Organic mulch free from deleterious materials and suitable for top dressing of trees, shrubs or plants and consisting of shredded hardwood in all plant beds unless noted otherwise.
- G. Edging: 1/8" thick, Black steel, with rolled safety top and Stakes; 10' segments.
- H. Anti-desiccant: Wiltpruf or approved equal.

2.03 FERTILIZER

- A. Fertilizer: Shall be a commercial formula containing at least the minimum analysis of 10 percent total Nitrogen, 10 percent Phosphoric Acid, 10 percent water soluble Potash (10-10-10) applied at the rate of 3 pounds per cu. yd.

2.04 WATER

- A. Water for the execution of this work and maintenance is the responsibility of the Contractor.

2.05 SOIL MATERIALS

- A. Topsoil: Type as specified in Section 31 0000. N/AN/A
- B. Planting Soil: Soil contents shall consist of 10 percent loam, 70 percent select granular material, 10 percent peat moss. Planting soil to be used in tree pits, perennial beds and ground cover as indicated in the details. Install a minimum of 18" planting soil in all bed and ground cover areas, and a minimum of 24" in tree pits.

2.06 SOIL AMENDMENT MATERIALS

- A. Fertilizer: Containing fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated in analysis.
 - 1. Nitrogen: 10 percent.
 - 2. Phosphoric Acid: 10 percent.
 - 3. Soluble Potash: 10 percent.

PART 3 EXECUTION

3.01 OBSTRUCTIONS BELOW GROUND

- A. In the event that rock or underground construction work or obstructions are encountered in any plant pit excavation work to be done under this Contract, alternate locations may be selected by the Landscape Architect. Where locations cannot be changed, the obstructions shall be removed to a depth of not less than three (3) feet below grade and no less than six (6) inches below bottom of ball or roots when plant is properly set at the required grade. The Contractor shall be responsible for the removal of such rock or underground obstructions encountered.

3.02 SHRUB & PERENNIAL PLANTING

- A. Layout: All shrub bed locations shall conform to the Drawings.
- B. Planting Holes: Conform to the minimum dimensions indicated in the Drawing Details.
- C. Planting: Scarify bottom of plant holes or beds. Set plants at correct spacing, remove containers, and fill with planting soil. set plants plumb.
- D. Weed Control Fabric and Mulch: Add weed control fabric over entire area to receive mulch. Overlap seams at least 12 inches. Add mulch at 4" depth over weed control fabric.

3.03 TREE PLANTING

- A. Layout: All tree locations will be staked by the Contractor in the field to conform to the Drawings. Locations shall be approved by the Landscape Architect prior to digging and placement. No material shall be planted without approval of the Landscape Architect. Where overhead obstructions are encountered, tree relocation shall be designated by the Landscape Architect.
- B. Planting Holes: Shall be essentially circular with a diameter two feet greater than the diameter of the ball of the tree. The depth of the pit shall be enough to set the flare of the tree to its original grade. The flare of the tree shall not be set below grade. If the native soil at the site is heavy or wet consult with the Landscape Architect to determine correct setting height of the tree.
- C. The side walls of the planting pits shall be scarified with a mattock, pick ax, spade or other appropriate tool.
- D. Planting Soil Preparation using Compost Amendment: Prior to delivery to the Project, the compost for soil amending shall be tested and the test results shall be approved by the Landscape Architect in accord with the following:
 - 1. The Contractor shall furnish a certification from the supplier that the materials have been produced by accepted aerobic composting techniques employing turning or aeration, pathogen reduction and curing.
 - 2. Prospective sources should be indicated to the Landscape Architect allowing at least six weeks prior to delivery for testing and approval. The Contractor shall bear all testing costs.
 - 3. All compost must be visually inspected upon delivery to the Project. Regardless of test results compost failing visual inspection for texture, total decomposition of raw materials and lack of odor, heat generation, pathogens, weed seed and extraneous matter shall be rejected.
 - 4. In amending in-place soil for individual planting holes or beds, Grade 2 Compost shall be blended with the in-place soil at a mix ratio of 2 parts soil to one part compost. Proportioning may be by loose volume or weight. Mixing shall be sufficient to produce a uniform blend of the mixture components.
- E. Setting of Trees:
 - 1. Dig planting hole to size specified in Planting Hole Dimensions Schedule and/or Planting Details on Drawings.
 - 2. Scarify sides and bottom of hole.
 - 3. Set tree on undisturbed native soil or thoroughly compacted backfill soil at the same depth it was grown in the nursery. In no case shall the flare of the tree root be set below grade.
 - 4. Lifting from the bottom of the root ball, the tree shall be placed in planting hole with burlap and wire basket, if used, intact. Once in place the plant shall be backfilled to within 12" of the top of the rootball and watered. Burlap shall removed from the top of balls and adjusted to prevent air pockets. No burlap shall be pulled from under the balls.
 - 5. Plumb and backfill with backfill soil specified in the Drawings.
 - 6. Apply water to settle plants and fill voids.
 - 7. Water thoroughly within 2 hours.
 - 8. Place 4" of shredded hardwood mulch within 48 hours of the second watering unless soil moisture is excessive. Use the diameter of planting hole width as the mulch area around every tree. Pull all mulch away from the trunk.
 - 9. If the native or in-place soils are of clay origin, set the plant 1-2" above grade or as directed by the Landscape Architect.
 - 10. If the Contractor encounters poorly drained soils, do not complete planting and contact the Landscape Architect. If the Contractor is authorized to proceed with planting on wet, poorly drained soils (indicated by mottled soils) do not construct watering basin; instead leave a two-inch high pedestal on the bottom of the planting pit.
- F. Pruning: Remove dead or damaged branches only. Do not cover any cuts. No leaders shall be cut. All pruning shall be done with clean, sharp tools.

- G. Tree Wrapping: No tree shall be wrapped before November 15th. Contractor shall remove all wrapping the following spring by April 15th. All deciduous trees shall be wrapped with material as specified. The wrapping bandage shall be secured at top and bottom of the trunk. The bandage shall cover the entire surface of the trunk to the height of the first branches. Bandaging shall start at the base of the tree unless otherwise specified and be made secure by taping off the top with duct tape.
- H. Tree Painting: The following trees are to be painted in all cases: oaks (except bur oak), lindens, locusts, maples, crabapples and mountain ash. Paint shall be undiluted exterior grade white latex paint. Apply with brush to achieve full coverage to first set of branches on tree. The Contractor shall be responsible for maintaining this condition for the duration of the warranty period.
- I. Tree Collar: Gently set plastic perforated corrugated pipe collar into top of root ball and surround with mulch. There shall be no mulch between collar and trunk of tree. The Contractor shall be responsible for maintaining this condition for the duration of the warranty.
- J. Staking: The Contractor shall stake all evergreen trees planted after October 1st. The stakes and guy wires shall be removed the following spring. The Contractor is responsible for maintaining all other trees in a upright position for the maintenance period. If the trees begin to lean during that period, the Contractor shall stake the trees using the methods described in the Drawings and use the materials described in the definitions above. The Contractor shall remove all staking in the spring following the planting.

3.04 MAINTENANCE

- A. The Contractor shall be required to make periodic checks on the total project to make certain that the materials are properly watered, cultivated, pruned, and that all guys and stakes are in proper adjustment, and that the sum of all conditions are contributing to the satisfactory progress of the materials, until such time as the work is approved by the Landscape Architect and accepted by the Owner.

3.05 PLANT WATERING AND MAINTENANCE

- A. The Contractor shall be required to make periodic checks on the total project to make certain that the materials are properly cultivated and pruned and that all guys and stakes are in proper adjustment, and that the sum of all conditions are contributing to the satisfactory progress of the materials.
- B. The Contractor is responsible to maintain and water the plant material until such time as the work is approved by the Landscape Architect and accepted by the Owner. Rainfall of 1" or more per week is equal to due watering. Rainfall shall be gauged at the site. Planting beds shall be maintained weed-free until final project completion.
- C. The Contractor shall monitor the planting material to assure that, if the site is irrigated, overwatering does not occur. Contractor shall be responsible for providing the owner a watering schedule for trees, shrubs and groundcover.

3.06 INSPECTION AND ACCEPTANCE

- A. Inspection of this work will be made by the Landscape Architect at the conclusion of the planting period upon written notice by the Contractor at least five days prior to anticipated date. Condition of shrubs and trees will be noted and recorded for reference at end of guarantee period.
- B. After inspection, the Contractor will be notified in writing by the Landscape Architect if there are any deficiencies of the requirements for Owner acceptance of the work.

3.07 GUARANTEE AND REPLACEMENT

- A. Plants and trees shall be guaranteed for a two year period after Owner acceptance and shall be alive and in satisfactory condition at the end of guarantee period. Such guarantee excludes vandalism.
- B. At the end of the guarantee period, inspection will be made by the Landscape Architect upon written notice by the Contractor at least five days before the anticipated date. Any shrub or tree

required under this Contract that is dead or not in satisfactory condition, as determined by the Architect, shall be removed from the site, and shall be replaced as soon as conditions permit during the normal planting season.

- C. If there is dispute regarding the condition and satisfactory establishment of a rejected plant, the Contractor may elect to allow such plant to remain through another complete growing season at which time the rejected plant or tree shall be replaced if found to be dead, unhealthy or badly impaired.
- D. All replacements shall be shrubs and trees of the same kind and size as specified in the plant list. Replacement costs shall be borne by the Contractor.
- E. Replacement plantings required at the end of the guarantee period are to be guaranteed for one (1) additional year. These trees and shrubs are subject to inspection and rejection by the Architect before and after planting.

3.08 CLEAN UP

- A. Any soil, manure, peat or similar material which has been brought onto paved areas by hauling operations or otherwise shall be removed promptly, keeping the area clean at all times. Upon completion of the planting, all excess soil, stones, and debris which have not previously been cleaned up shall be removed from site or disposed of.
- B. All ground area disturbed as a result of planting operations shall be restored to their original condition or to the desired new appearance.

END OF SECTION 32 9300

