University of Colorado Denver
CU Denver Building Electrical System Upgrades

Project Manual
100% Construction Documents

Prepared for:

University of Colorado Denver
CU IN THE CITY

December 1, 2023
SBEC #210032
UCD PN 21-174017
SECTION 00 01 03 – PROJECT DIRECTORY

University of Colorado - Denver
CU Denver Building Electrical System Upgrades
CU Project #: 21-174017
SBEC # 210032

PROJECT TEAM

OWNER: CU Denver Lawrence Building
1380 Lawrence Street, Suite 320
Denver, CO 80202

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E-mail: Michael.Barden@cuanschutz.edu

Bill Doran – Senior Project Manager
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E-mail: bill.doran@cuanschutz.edu

ELECTRICAL ENGINEER: Shaffer • Baucom Engineering & Consulting
3900 S. Wadsworth Blvd Suite 600
Lakewood, CO 80235
Telephone: 303-986-8200

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ARCHITECT: Architectural Workshop
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Denver, CO 80223
Telephone: 303-788-1717

Joe Marshall, AIA – Associate Principal
E-mail: jmarshall@archshop.com

END OF SECTION 00 01 03
SECTION 00 01 07 - PROFESSIONAL SEALS PAGE

The following Specification Sections have been prepared by or under the direct supervision of the Architect:

ARCHITECT
Architectural Workshop
2 Kalamath Street
Denver, Colorado 80223

ARCHITECTURAL SPECIFICATIONS

DIVISION 02
02 81 00 – TRANSPORTATION/DISPOSAL OF HAZARDOUS MATERIAL

DIVISION 06
06 10 53 – MISCELLANEOUS ROUGH CARPENTRY

DIVISION 07
07 92 00 - JOINT SEALANTS

DIVISION 08
08 00 00 - OPENINGS
08 30 50 – ACCESS DOORS

DIVISION 09
09 00 00 - FINISHES
09 22 16 – NON-STRUCTURAL METAL FRAMING
09 29 00 – GYPSUM BOARD
09 51 13 – ACOUSTICAL PANEL CEILINGS
09 68 13 – TILE CARPETING
09 91 23 – INTERIOR PAINTING

END OF ARCHITECTURAL SECTIONS

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PROFESSIONAL SEAL PAGE
The following Specification Sections have been prepared by or under the direct supervision of the Electrical Engineer:

ELECTRICAL ENGINEER
Shaffer Baucom Engineering & Consulting
3900 S. Wadsworth Boulevard, Suite 600
Lakewood, Colorado 80235

ELECTRICAL SPECIFICATIONS

DIVISION 26

26 01 00 - BASIC ELECTRICAL REQUIREMENTS
26 05 05 - ELECTRICAL DEMOLITION AND ALTERATIONS
26 05 19 - LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES
26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33.13 - CONDUIT FOR ELECTRICAL SYSTEMS
26 05 33.16 - BOXES FOR ELECTRICAL SYSTEMS
26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 05 73 - POWER SYSTEM STUDIES
26 05 83 - WIRING CONNECTIONS
26 08 00 - ELECTRICAL COMMISSIONING REQUIREMENTS
26 22 00 - LOW-VOLTAGE TRANSFORMERS
26 24 13 - SWITCHBOARDS
26 24 16 - PANELBOARDS
26 28 13 - FUSES
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26 43 00 – SURGE PROTECTIVE DEVICES

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DIVISION 02

02 81 00 – TRANSPORTATION/DISPOSAL OF HAZARDOUS MATERIAL

DIVISION 06

06 10 53 – MISCELLANEOUS ROUGH CARPENTRY

DIVISION 07

07 92 00 - JOINT SEALANTS

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END OF SECTION 00 01 00
SECTION 00 11 00 – ADVERTISEMENT FOR BIDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project advertisement

1.3 DEFINITIONS

A. ADVERTISEMENT: Posting of project description, requirements, schedule, and related requirements necessary to solicit submittals from contractors.

1.4 ADVERTISEMENT

A. FORM: State of Colorado form “Advertisement for Bids for Contractor’s Agreement Design/Bid/Build” (OSA-AFB-1)

B. A copy of the above noted form is attached at the end of this section.

1.5 PROCEDURE

A. If project is less than $25,000 or greater than $500,000, remove red “Open to SCPP” box.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 11 00
ADVERTISEMENT FOR BIDS
Design/Bid/Build
State of Colorado
The University of Colorado – Denver
Notice Number: NA

Project No: 21-174017
Project Title: Upgrade Elec Sys, CU Den Bldg.
Estimated Construction Cost: $1,950,000.00

Settlement Notice
For all projects with a total dollar value above $150,000 Notice of Final Settlement is required by C.R.S. §38-26-107(1). Final Settlement, if required, will be advertised in the same location as the original solicitation.

Project Description

The project scope includes the replacement and upgrade of the electrical equipment throughout the building. The existing service from Xcel Energy on the ninth floor shall remain existing and shall be reworked to serve a new Main Distribution Center. The distribution boards, branch panel boards, and transformers within the building shall be replaced unless noted as acceptable to remain existing on the drawings. The feeders throughout the building are to be reworked according to the new electrical distribution arrangement shown. There will be new owner use metering of the system throughout as shown on the drawings and networked together with connections to the owners monitoring system.

Because this is an active building, the following procedures and conditions must be accounted for:

- Any and all power outages MUST be coordinated through the University Project Manager who will work with the university outage coordinator to arrange for outages. All appropriate lead times for notifications must be followed prior to any outage request (see section 01 73 05)
- In order to minimize the impact of this work on the faculty and students, the work will be scheduled between May 31st and August 15th (summer break). We will plan to move any summer classes that are in session during this time to another building.
- Fire alarm and suppression systems, and emergency power systems must remain functioning at all times through the use of a generator as necessary
- Campus security must be notified prior to any shut downs of the security systems or card reader systems
Clarification of Schedule Note*

No physical work shall be done in this building until all materials have arrived and been inspected and approved by the architect/engineer. As mentioned above, the time frame for the work will be May 31st thru August 15th. If the switch gear and all other equipment will arrive prior to May 15th 2024, then the work can be done during the summer of 2024. If lead times push the arrival of the switch gear into the summer and therefore the project will extend beyond August 15th 2024, then the project must be done between May 31st and August 15th 2025.

Please consider this when bidding.

Scope of Services

Provide construction services for full scope of work as described in the Project Description

Minimum Requirements

Notice is hereby given to all interested parties that all firms will be required to meet all minimum requirements to be considered for this project. Proof of qualification to bid must be provided NO LATER than 2pm on 2/27/24 with sealed bid. To be considered as qualified, interested firms shall have, as a minimum:

1. Provided Electrical Contracting services within the last seven (7) years for at least three (3) projects each in excess of $2,000,000.00 (hard costs), utilizing the expertise present in their Colorado Office; and

2. Demonstrated specific Electrical Contracting experience as the Prime Contractor in projects of similar scope and complexity to include coordination of any and all other trades needed to complete the project (including, for example, drywall repair and painting); and

3. Demonstrated bonding capability up to $2,250,000.00 for an individual project coincidentally with current and anticipated workloads; provide letter from surety that affirms this capacity.

Firms meeting the minimum requirements may obtain the bidding documents on the website accompanying this advertisement.

University of Colorado Denver | Anschutz Medical Campus Facilities Projects – Request for Bid website: [https://www.cuanschutz.edu/offices/facilities-management/construction-projects/RFP](https://www.cuanschutz.edu/offices/facilities-management/construction-projects/RFP)
Comments: **Late sealed bids will be rejected without consideration. The University of Colorado - Denver and the State of Colorado assume no responsibility for costs related to the preparation of submittals.**

**Other Information**

Preference shall be given to Colorado resident bidders and for Colorado labor, as provided by law.

Per C.R.S. §24-105-201 If the construction value is $50,000 or greater a Bid Bond and Power of Attorney or Proposal Guaranty is required in an amount not less than 5% of the total Bid.

**Pre-Bid Meeting**

A mandatory Pre-Bid Meeting will be held at:

- **Address:** 1250 14th St, Denver CO 80202
- **Room:** First Floor Lobby
- **Date/Time:** 1/23/24 @ 10:00am

**Schedule/Submission Details**

1. The schedule of events for the AFB process and an outline of the schedule for the balance of the project is as follows:

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertisement</td>
<td>1/16/24</td>
</tr>
<tr>
<td>Mandatory Pre-Bid Conference and Tour</td>
<td>1/23/24 @ 10am</td>
</tr>
<tr>
<td>Date Email Questions Due</td>
<td>2/6/24 @ 2pm</td>
</tr>
<tr>
<td>Date Email Answers Issued</td>
<td>2/13/24 @ 2pm</td>
</tr>
<tr>
<td>Sealed Bids and Qual Packs Due/Public Bid Opening</td>
<td>2/27/24 @ 2pm</td>
</tr>
<tr>
<td>Negotiation of General Contractor Contract</td>
<td>TBD</td>
</tr>
<tr>
<td>Contract Approval (projected)</td>
<td>TBD</td>
</tr>
<tr>
<td>Anticipated Design Start</td>
<td>Completed</td>
</tr>
<tr>
<td>Anticipated General Contractor Start</td>
<td>See Clarification of Schedule Note*</td>
</tr>
<tr>
<td>Anticipated Construction Start/Finish</td>
<td>See Clarification of Schedule Note*</td>
</tr>
</tbody>
</table>

2. One (1) electronic copy of the bid is due 2/27/24 and shall be received no later than 2:00 PM (MD/ST), and shall be submitted/accepted: https://ucdenverdata.formstack.com/forms/rfp_rfq_submission
Comments: Late sealed bids will be rejected without consideration. The University of Colorado Denver Campus and the State of Colorado assume no responsibility for costs related to the preparation of submittals.

3. The above schedule is tentative. Responding firms shall be notified of revisions in a timely manner by email or posted on ColoradoVSS website. Respondents may elect to verify times and dates by email, but no earlier than 36 hours before the scheduled date and time.

Point of Contact/Clarification

Name: Bill Doran
Agency: University of Colorado - Denver
Phone: 720-438-9496
Fax: NA
Email: bill.doran@cuanschutz.edu

This Notice is also available on the web at:

https://codpa-vss.cloud.cgifederal.com/webapp/PRDVSS2X1/AltSelfService

media of Publication(s):
University of Colorado Denver Facilities Projects Website Colorado CORE/Colorado VSS
Publication Dates: 1/16/24

APPENDICES:

Appendix A: Information for Bidders (SBP-6.12) – refer to project manual section 00 21 13

Appendix B: Bid Form (SBP-6.13) see attached

Appendix B1: Bid Alternates (SBP-6.131) (if Applicable) - refer to project manual section 00 43 23

Appendix B2: Unit Pricing (SBP-6.133) (if Applicable)

Appendix B3: Bid Bond (SBP-6.14) (if Applicable) - refer to project manual section 00 43 13

Appendix C: Sample: Direct Labor Burden Calculation (SBP-6.18) - refer to project manual section 00 41 55

Appendix D: Applicable Prevailing Wage and Apprenticeship and Fringe Rates

Appendix E: Apprenticeship Utilization Certifications (SBP-6.17)
SECTION 00 21 13 - INFORMATION TO BIDDERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 INFORMATION TO BIDDERS

A. State of Colorado form "Information to Bidders" (SBP-6.12).

B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 21 13
1. **BID FORM:** Bidders are required to use the Bid form attached to the bidding documents. Each bidder is required to bid on all alternates and indicate the time from the date of the Notice to Proceed to Substantial Completion in calendar days, and in addition, the bidder is required to indicate the period of time to finally complete the project from Substantial Completion to Final Acceptance, also in calendar days. Bids indicating times for Substantial Completion and Final Acceptance in excess of the number of days indicated in the Advertisement for Bids for completion of the entire Project may be found non-responsive and may be rejected. The bid shall not be modified or conditioned in any manner. One (1) electronic copy of the bid is due 2/04/2024 and shall be received no later than 2:00 PM (MD/ST), and shall be submitted/accepted: [https://ucdenverdata.formstack.com/forms/rfp_rfq_submission](https://ucdenverdata.formstack.com/forms/rfp_rfq_submission)

**Comments:** Late sealed bids will be rejected without consideration. The University of Colorado Anschutz Medical Campus and the State of Colorado assume no responsibility for costs related to the preparation of submittals.

2. **INCONSISTENCIES AND OMISSIONS:** Bidders may request clarification of any seeming inconsistencies, or matters seeming to require explanation, in the bidding documents at least three (3) business days prior to the time set for the opening of Bids. Decisions of major importance on such matters will be issued in the form of addendum.

3. **APPLICABLE LAWS AND REGULATIONS:** The bidder’s attention is called to the fact that all work under this Contract shall comply with the provisions of all state and local laws, approved state building codes, ordinances and regulations which might in any manner affect the work to be done or those to be employed in or about the work. Attention is also called to the fact that the use of labor for work shall be governed by the provisions of Colorado law which are hereinafter set forth in Articles 27 and 52E of the GENERAL CONDITIONS. This includes the requirements for apprenticeship and prevailing wage on Public Projects.

4. **BID SECURITY:** A bid security of not less than 5% of the bid price is required when the price is estimated to be $50,000 or more. The security shall be a bond by a surety company, the equivalent in cash, or otherwise supplied in a form satisfactory for the State. Noncompliance requires the bid to be rejected as nonresponsive.

5. **TAXES:** The bidder’s attention is called to the fact that the Bid submitted shall exclude all applicable federal excise or manufacturers’ taxes and all state sales and use taxes as hereinafter set forth in Article 9C of the GENERAL CONDITIONS.

6. **OR EQUAL:** The words “OR EQUAL” are applicable to all specifications and drawings relating to materials or equipment specified. Any material or equipment that will fully perform the duties specified, will be considered “equal”, provided the bid submits proof that such material or equipment is of equivalent substance and function and is approved, in writing. Requests for the approval of “or equal” shall be made in writing at least five (5) business days prior to bid opening. During the bidding period, all approvals shall be issued by the Architect/Engineer in the form of addenda at least two (2) business days prior to the bid opening date.

7. **ADDENDA:** Owner/architect initiated addenda shall not be issued later than two (2) business days prior to bid opening date. All addenda shall become part of the Contract Documents and receipt must be acknowledged on the Bid form.
9. **METHOD OF AWARD - LOWEST RESPONSIBLE BIDDER:** If the bidding documents for this project require alternate prices, additive and/or deductible alternates shall be listed on the alternates bid form provided by the Principal Representative. Bidders should note the Method of Award is applicable to this Bid as stated below.

   A. **DEDUCTIBLE ALTERNATES:** The lowest responsible Bid, taking into account the Colorado resident bidder preference provision of Colorado law, will be determined by and the contract will be awarded on the base bid combined with deductible alternates, deducted in numerical order in which they are listed in the alternates bid form provided by the Principal Representative. The subtraction of alternates shall result in a sum total within available funds. If this bid exceeds such amount, the right is reserved to reject all bids. An equal number of alternates shall be subtracted from the base bid of each bidder within funds available for purposes of determining the lowest responsible bidder.

   B. **ADDITIVE ALTERNATES:** The lowest responsible Bid, taking into account the Colorado resident bidder preference provision of Colorado law, will be determined by and the contract will be awarded on the base bid plus all additive alternates added in the numerical order in which they are listed in the alternates bid form provided by the Principal Representative. The addition of alternates shall result in a sum total within available funds. If this bid exceeds such amount, the right is reserved to reject all bids. An equal number of alternates shall be added to the base bid of each bidder within funds available for purposes of determining the lowest responsible bidder.

   C. **DEDUCTIBLE AND ADDITIVE ALTERNATES:** Additive alternates will not be used if deductible alternates are used and deductible alternates will not be used if additive alternates are used.

10. **NOTICE OF CONTRACTOR’S SETTLEMENT** – Agencies/institutions must indicate in the initial Solicitation (Advertisement for Bids, Documented Quotes, or Requests for Proposals) whether settlement will be advertised in newspapers or electronic media.
SECTION 00 41 53 – BID FORM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

   A. 00 43 13 - Bid Bond (SPB-6.14)

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 BID FORM


   B. A copy of the above noted form is attached to the end of this section.

   C. Additional State and University of Colorado forms to be attached to the submitted bid are listed in the Articles below.

1.05 PROCEDURES

   A. The durations for Bidder’s Time of Completion shall match the project advertisement duration.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 41 53
KNOW ALL MEN BY THESE PRESENTS:

WHEREAS, Board of Regents of the University of Colorado, a body corporate, for and on behalf of the University of Colorado Denver, hereinafter called the "PRINCIPAL", is submitting a PROPOSAL for the above described project, to the STATE OF COLORADO, hereinafter called the "OBLIGEE".

WHEREAS, the Advertisement for Bids has required as a condition of receiving the Proposals that the Principal submit with the PROPOSAL GUARANTY in an amount not less than five per cent (5%) of the Proposal, which sum it is specifically agreed is to be forfeited as Liquidated Damages in the event that the Principal defaults in his obligation as hereinafter specified, and, in pursuance of which Requirement, this Bid is made, executed and delivered.

NOW THEREFORE, the Principal and ________________, a corporation of the State of ________________, duly authorized to transact business in Colorado, as Surety, are held and firmly bound unto the Obligee, in the sum of five per cent (5%) of the Principal's total bid price, lawful money of the United States for the payment of which sum, well and truly to be made to the Obligee, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

FURTHER THAT, a condition of the obligation that the Principal shall maintain his Proposal in full force and effect for thirty (30) days after the opening of the proposals for the project, or, if the Principal’s Proposal is accepted, the Principal shall, within the prescribed time, execute the required Agreement, furnish the required Performance Bond, Labor and Material Payment Bond, Insurance Policy, and Certificates of Insurance, then this obligation shall be null and void, otherwise it shall remain in full force and effect, and subject to forfeiture upon demand as Liquidated Damages.

IN WITNESS WHEREOF said Principal and Surety have executed this Bond, this __________ day of ______, A.D., 20__.  

(Corporate Seal)

THE PRINCIPAL

Company Name

ATTEST

Secretary

Address (including city, state and zip)

Phone number:

Name (Print)

Signature

Name (Print) and Title

SIGNATURES  If the “Principal" is doing business as a Corporation, the Bid Bond shall be signed by an officer, i.e., President or Vice President. The signature of the officer shall be attested to by the Secretary and properly sealed.

If the “Principal" is an individual or a partnership, the Bid Bond shall so indicate and be properly signed.

(Corporate Seal)

THE SURETY

By ____________________________

Secretary

Attorney-in-Fact

THIS BOND MUST BE ACCOMPANIED BY POWER OF ATTORNEY, EFFECTIVELY DATED.
FAILURE TO PROVIDE A PROPERLY EXECUTED BID BOND WITH A PROPERLY EXECUTED POWER OF ATTORNEY WILL RESULT IN THE BIDDER’S PROPOSAL BEING DEEMED NON-RESPONSIVE.
STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAMS  
BID

Institution/Agency:  University of Colorado Denver

Project No./Name:  21-174017 – CU Denver Building Electrical System Upgrades

Bidder Acknowledges Receipt of Addenda Numbers:

Bidder Anticipates Services outside the United States or Colorado:*  
Yes ☐ If Yes see 3A below  
No ☐ If No see 3B below  
No ☐ If No see 3C below

Bidder will comply with 80% Colorado Labor on project above $500,000:

Yes ☐ No ☐ If No see 3B below

Bidder is a Service-Disabled Veteran Owned Small Business:*  
Yes ☐ If Yes see 3C below

Base Bid

(Refer to Bid Alternate Form SC-6.13.1 Attached, If Applicable)

Bidder’s Time of Completion

a. Time Period from Notice to Proceed to Substantial Completion:

b. Time Period from Substantial Completion to Final Acceptance:

c. Total Time of Completion of Entire Project (a + b):

1. BID: Pursuant to the advertisement by the State of Colorado dated the undersigned bidder hereby proposes to furnish all the labor and materials and to perform all the work required for the complete and prompt execution of everything described or shown in or reasonably implied from the Bidding Documents, including the Drawings and Specifications, for the work and for the base bid indicated above. Bidders should include all taxes that are applicable.

2. EXAMINATION OF DOCUMENTS AND SITE: The bidder has carefully examined the Bidding Documents, including the Drawings and Specifications, and has examined the site of the Work, so as to make certain of the conditions at the site and to gain a clear understanding of the work to be done.

3. PARTICIES INTERESTED IN BID: The bidder hereby certifies that the only persons or parties interested in this Bid are those named herein, and that no other bidder or prospective bidder has given any information concerning this Bid.

A. If the bidder anticipates services under the contract or any subcontracts will be performed outside the United States or Colorado, the bidder shall provide in a written statement which must include, but need not be limited to the type of services that will be performed at a location outside the United States or Colorado and the reason why it is necessary or advantageous to go outside the United States or Colorado to perform such services. (Does not apply to any project that receives federal moneys) *

B. For State Public Works projects per C.R.S. 8-17-101, Colorado labor shall be employed to perform at least 80% of the work. Colorado Labor means any person who is a resident of the state of Colorado at the time of the Public Works project. Bidders indicating that their bid proposal will not comply with the 80% Colorad Labor requirement are required to submit written justification along with the bid submission. (Does not apply to any project that receives federal moneys) *

C. A Service-Disabled Veteran Owned Small Business (SDVOSB) per C.R.S. 24-103-211, means a business that is incorporated or organized in Colorado or maintains a place of business or has an office in Colorado and is officially registered and verified by the Center for Veteran Enterprise within the U.S. Department of Veteran Affairs. Attach proof of certification along with the bid submission. *
4. **BID GUARANTEE:** This Bid is accompanied by the required Bid Guarantee. You are authorized to hold said Bid Guarantee for a period of not more than thirty (30) days after the opening of the Bids for the work above indicated, unless the undersigned bidder is awarded the Contract, within said period, in which event the Director, State Buildings Programs, may retain said Bid Guarantee, until the undersigned bidder has executed the required Agreement and furnished the required Performance Bond, Labor and Material Payment Bond, Insurance Policy and Certificates of Insurance and Affidavit Regarding Unauthorized Immigrants.

5. **TIME OF COMPLETION:** The bidder agrees to achieve Substantial Completion of the Project from the date of the Notice to Proceed within the number of calendar days entered above, and in addition, further agrees that the period between Substantial Completion and Final Acceptance of the Project will not exceed the number of calendar days noted above. If awarded the Work, the bidder agrees to begin performance within ten (10) days from the date of the Notice to Proceed subject to Article 46, Time of Completion and Liquidated Damages of the General Conditions of the Contract, and agrees to prosecute the Work with due diligence to completion. The bidder represents that Article 7D of the Contractor’s Agreement (SC-6.21) has been reviewed to determine the type and amount of any liquidated damages that may be specified for this contract.

6. **EXECUTION OF DOCUMENTS:** The bidder understands that if this Bid is accepted, bidder must execute the required Agreement and furnish the required Performance Bond, Labor and Material Payment Bond, Insurance Policy and Certificates of Insurance and Affidavit Regarding Unauthorized Immigrants within ten (10) days from the date of the Notice of Award, and that the bidder will be required to sign to acknowledge and accept the Contract Documents, including the Drawings and Specifications.

7. **ALTERNATES:** Refer to the Information for Bidders (SC-6.12) for Method of Award for Alternates and use State Form SBP-6.13.1 Bid Alternates form to be submitted with this bid form if alternates are requested by the institution/agency in the solicitation documents.

8. **Submit wage rates** (direct labor costs) for prime contractor and subcontractor as requested by the institution/agency in the solicitation documents.

9. **The right is reserved to waive informalities and to reject any and all Bids.**

*Does not apply to projects for Institutions of Higher Education that have opted out of the State Procurement Code.*

SIGNATURES: If the Bid is being submitted by a Corporation, the Bid shall be signed by an officer, i.e., President or Vice-President. If a sole proprietorship or a partnership is submitting the Bid, the Bid shall so indicate and be properly signed.

Dated this ______ Day of __________________ , 20_____

THE BIDDER:

Company Name __________________________ ADDRESS (including city, state and zip) ________________

Phone number: __________________________

Name (Print) and Title __________________________ Signature __________________________

State Form SBP-6.13
Rev 1/2019
SECTION 00 41 55 – DIRECT LABOR BURDEN CALCULATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 DIRECT LABOR BURDEN CALCULATION


   B. A copy of the above noted form is attached to the end of this section.

   C. Additional State and University of Colorado forms to be attached to the submitted bid are listed in the Articles below.

1.05 PROCEDURES

   A. The form shall be submitted for the bidding firm on award of low bid and prior to contract being issued.

   B. Submission of a project bid acknowledges agreement of this requirement. Fail to submit this form may deem a bid as non-responsive

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 41 55
This form is required to be submitted for review prior to execution of a construction agreement.

List items below by the percentage of what makes up the total labor burden; Items include benefits that a contractor pays to employees on their payroll. Examples include taxes, pension cost, health and dental insurance etc. The Labor Burden amount must be agreed to by both the contractor and Principal Representative and will be included in the contract as part of Exhibit A and will be used in the calculation of any future Change Order Proposals (SC-6.312) Line 2.

Major sub-contractors defined as electricians, plumbers, mechanical contractors, excavators, millwork, concrete, block layers etc. Please provide one (1) Labor Burden Calculation Sheet per contractor and for each sub-contractor. These labor burdens shall be used in the calculation of any future Change Order Proposals (SC-6.312) Line 10.

State reserves the right to require back-up confirmation of all information included in this calculation.

<table>
<thead>
<tr>
<th>Percent of Salary Paid</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payroll Taxes</td>
<td></td>
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<tr>
<td>Pension Costs</td>
<td></td>
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<tr>
<td>Health Insurance</td>
<td></td>
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<tr>
<td>Dental Insurance</td>
<td></td>
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<tr>
<td>Life Insurance</td>
<td></td>
</tr>
<tr>
<td>Other (Specify)</td>
<td>Description:</td>
</tr>
<tr>
<td>Other (Specify)</td>
<td>Description:</td>
</tr>
</tbody>
</table>

Total Labor Burden: 0%
SECTION 00 43 23 – BID ALTERNATES FORM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. 00 41 53 - Bid Form (SPB-6.13)

B. 01 23 00 - Alternates

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 BID FORM

A. FORM: State of Colorado form “Bid Alternates Form” (SBP-6.131).

B. A copy of the above noted form is attached to the end of this section.

C. Additional State and University of Colorado forms to be attached to the submitted bid are listed in the Articles below.

1.05 PROCEDURES

1.06 A. Fill out each alternate as shown in project documents with associated cost.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 43 23
Institution/Agency: University of Colorado Denver
Project No./Name: 21-174017 – CU Denver Building Electrical System Upgrades

Additive alternates will not be used if deductible alternates are used and deductible alternates will not be used if additive alternates are used.

Additive Alternates (If Applicable)
Refer to specification section 01 23 00 - ALTERNATES for descriptions of deductive alternates. If the deductive alternates are accepted, the base bid would be modified by the amount entered by the bidder.

| D.A. No. 1 | Provide a Deductive Alternate scope to leave the panelboards and transformers noted on the plans as existing in lieu of replacing them. | Add $ |
| D.A. No. 2 | Provide a Deductive Alternate to not furnish and install new 30kVA transformer and panelboard within the P1 Garage Pump Room to be fed from existing panel H1F. | Add $ |
| D.A. No. 3 | Provide a Deductive Alternate to not replace the panelboards and transformers serving the 4th floor Woodshop as noted on the drawings. | Add $ |

THE BIDDER:

Company Name

Signature Date
SECTION 00 45 17 – SUBCONTRACTOR PREQUALIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY (Not Applicable)

1.3 DEFINITIONS (Not Applicable)

1.4 SUBCONTRACTOR PREQUALIFICATION

   A. FORM: University of Colorado Denver | Anschutz Medical Campus “Subcontractor’s Statement of Experience.”

   B. A copy of the above noted document is attached to the end of this section.

1.5 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 45 17
SUBCONTRACTOR’S STATEMENT OF EXPERIENCE

Project Name: CU Denver Building Electrical System Upgrades

Project # 21-174017

Project Manager: __________________________
Phone: __________________________
Email: __________________________

Architect/Engineer: Shaffer Baucom Engineering & Consulting

- This is a project specific qualification form. Subcontractor must fill this out on each project.
INDEX OF DOCUMENTS

• INFORMATION FORM Page 1 of 13
• TYPES OF WORK Page 2 of 13
• IDENTIFICATION FORM Page 3, 4 of 13
• PERSONNEL OF ORGANIZATION FORM Page 5 of 13
• PROJECT EXPERIENCE FORM Page 6 of 13
• WORK CURRENTLY UNDER CONTRACT FORM Page 7 of 13
• SURETIES FORM Page 8 of 13
• CORPORATION / CO-PARTNERSHIP FORM Page 9 of 13
• AFFIDAVIT FOR CORPORATION Page 10 of 13
• AFFIDAVIT FOR CO-PARTNERSHIP Page 11 of 13
• AFFIDAVIT FOR INDIVIDUAL Page 12 of 13
• BIDDING INFORMATION Page 13 of 13
INFORMATION FORM

STATEMENT OF ____________________________
(Subcontractor)

ADDRESS ________________________________
(Street or PO Box) (City) (State) (Zip)

TELEPHONE/FAX NO. ____________ ____________
(telephone) (fax)

DATE OF EXPERIENCE STATEMENT ______________

PRINCIPLE OWNER/OFFICER ________________________
(Names(s) and Official Title(s))

Please indicate below if your company qualifies as one of the following:

Minority Business Enterprise (MBE)  YES ___ NO ___
Justification: _________________________________
___________________________________________
___________________________________________

Woman-Owned Business Enterprise (WBE) YES ___ NO ___
Justification: _________________________________
___________________________________________
___________________________________________

Small Business Enterprise (SBE)  YES ___ NO ___
Justification: _________________________________
___________________________________________
___________________________________________

Disadvantaged Business Enterprise (DBE)  YES ___ NO ___
Justification: _________________________________
___________________________________________
___________________________________________
(1) If you are a General Contractor interested in bidding on all types of construction, mark “All Classes of Construction” only.
(2) If you are interested in contracting directly with the University for certain types of work only, mark in the column provided after the particular types of work on which you wish to bid.

<table>
<thead>
<tr>
<th>TYPES OF WORK</th>
<th>MARK WITH (X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. All Classes of Construction</td>
<td></td>
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<tr>
<td>2. General</td>
<td></td>
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<tr>
<td>3. Mechanical</td>
<td></td>
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<tr>
<td>4. Electrical</td>
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<tr>
<td>5. Excavating and Grading</td>
<td></td>
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<tr>
<td>6. Concrete</td>
<td></td>
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<tr>
<td>7. Structural Steel</td>
<td></td>
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<tr>
<td>8. Steel and Miscellaneous Iron</td>
<td></td>
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<tr>
<td>9. Painting and Decorating</td>
<td></td>
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<tr>
<td>10. Laboratory Equipment</td>
<td></td>
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<tr>
<td>11. Elevator Installation</td>
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<tr>
<td>12. Plumbing</td>
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<tr>
<td>13. Heating and Ventilating</td>
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<tr>
<td>14. Air Conditioning</td>
<td></td>
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<tr>
<td>15. Boiler and Equipment</td>
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<tr>
<td>16. Environmental (Describe)</td>
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<td>17. Other (Describe)</td>
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<td>18. Other (Describe)</td>
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<td>19. Other (Describe)</td>
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<tr>
<td>20. Other (Describe)</td>
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</tbody>
</table>
UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS
SUBCONTRACTOR’S QUALIFICATION STATEMENT

IDENTIFICATION

(The signatory of this questionnaire guarantees the truth and accuracy of all statements and of all answers to questions hereinafter made.)

LEGAL NAME ________________________________

PRINCIPAL OFFICE ____________________________
(Street or PO Box) ____________________________
(City) ____________________________ (State) ____________________________ (Zip)

_____ A Corporation _____ A Copartnership _____ An Individual _____ Combination

GENERAL INFORMATION

A. Are you licensed as a contractor? Yes ( ) No ( )

Licensed in ____________________________
the name of ____________________________
Location ____________________________ (City or State)
License No. & Type ____________________________

B. How many years has your organization been in business as a contractor under your present business name? ____________

C. How many years experience in ____________________________ construction work has your organization had? (Type)

(a) As a prime contractor? ____________ (b) As a subcontractor?

D. Have you or your organization, or any officer or partner thereof, failed to complete a contract? ______

If so, give details ____________________________

E. If you have a controlling interest in any firms presently qualified with the University, show names thereof:

 ____________________________

F. We normally perform ___% of the work with our own forces.

List trades: ____________________________

Where qualification is based on a combination of several organizations, show the experience and equipment of the combined organizations.
G. Has your firm been involved in any litigation in the past five (5) years? Yes ( ) No ( )
   If yes, explain (listing type, kind, plaintiff, defendant, etc. and state the current status).

H. Are there any activities or interests of officers, principle stockholders, or employees of
   your firm or other factors which would place your firm and the University of Colorado
   Denver in a position of “Conflict of Interests”?
   Yes ( ) No ( ) If yes, or in doubt, explain.

I. Has your firm ever been involved in any bankruptcy action as a bankrupt?
   Yes ( ) No ( ) If yes, explain.
PERSONNEL OF ORGANIZATION

1. Name the persons with whom you have been associated in business as partners or business associates in each of the last five (5) years.

   
   
   
   

2. Show the construction experience of the principal individuals of your present organization in the following tabulation:

<table>
<thead>
<tr>
<th>Individual’s Name</th>
<th>Present Position or Office in Your Organization</th>
<th>Years of Construction Experience</th>
<th>Magnitudes and Type of Work</th>
<th>In What Capacity</th>
</tr>
</thead>
</table>
PROJECT EXPERIENCE

Show the projects your organization has completed during the last five years in the following tabulation:

<table>
<thead>
<tr>
<th>Year Completed</th>
<th>Project</th>
<th>Type of Work (See Page 2)</th>
<th>Location</th>
<th>Contract Value</th>
<th>Contracting Authority</th>
<th>In what Capacity</th>
</tr>
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<tbody>
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</table>
### WORK CURRENTLY UNDER CONTRACT

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<tr>
<th>Expected Completion Date</th>
<th>Project</th>
<th>Type of Work (See Page 1)</th>
<th>Location</th>
<th>Contract Value</th>
<th>Contracting Authority</th>
<th>Architect or Engineer</th>
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</tbody>
</table>
SURETIES

List the Surety Companies that have bonded your work for the past five (5) years:

<table>
<thead>
<tr>
<th>Name of Surety and Name and Address of Agent</th>
<th>Project and Location</th>
<th>Period of Bond From</th>
<th>Period of Bond To</th>
<th>General Comments</th>
</tr>
</thead>
</table>
CORPORATION / CO-PARTNERSHIP

CORPORATION:
(if a corporation, answer this:)

When Incorporated __________________________

In What State ______________________________

President’s Name ____________________________

Vice President’s Name ________________________

Secretary’s Name _____________________________

Treasurer’s Name _____________________________

CO-PARTNERSHIP:
(if a co-partnership, answer this:)

Date of Organization _________________________

State whether partnership is general, limited, or association

Name and address of each partner:

_________________________ (name) ________________ (name)

_________________________ (address) ________________ (address)

WHERE QUALIFICATION IS BASED ON A COMBINATION OF ORGANIZATIONS, THE APPROPRIATE (ATTACHED) AFFIDAVITS MUST BE EXECUTED FOR EACH MEMBER OF SUCH COMBINATION.
AFFIDAVIT FOR CORPORATION

__________________________________________certifies and says: That he is
(Name of officer)

__________________________________________of the ___________________ (Official capacity)
corporation submitting this statement of experience: that he/she has read the same, and
that the same is true of his/her own knowledge: that the statement is for the purpose of
inducing the University of Colorado Denver to supply the submitter with plans and
specifications, and that any vendor, or other agency therein named is hereby authorized
to supply the University of Colorado Denver with any information necessary to verify the
statement: and that furthermore, should this statement at any time cease to properly and
truly represent his/her condition in any substantial respect, it will refrain from further
bidding on University work until it shall have submitted a revised and corrected statement.

I certify and declare under penalty of perjury that the foregoing is true and correct:

Subscribed on _____ at ____, _____. State of _______
(date) (city) (county)

NOTE: Use full corporate name and
attach corporate seal here. ___________________
(Officer must sign here)

NOTE: Statement will be returned unless affidavit is completed in EVERY respect.
UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS
SUBCONTRACTOR’S QUALIFICATION STATEMENT

AFFIDAVIT FOR CO-PARTNERSHIP

_________________________ certifies and says: That he/she is a partner of
(Name of partner)
the partnership of _______________: That said partnership
(Name of Firm)

submitted this statement of experience: that he/she has read the same, and that the
same is true of his/her own knowledge: that the statement is for the purpose of inducing
the University of Colorado Denver to supply the submitor with plans and specifications,
and that any vendor, or other agency therein named is hereby authorized to supply the
University of Colorado Denver with any information necessary to verify the statement:
and that furthermore, should this statement at any time cease to properly and truly
represent the condition of said firm in any substantial respect, it will refrain from further
bidding on University work until they shall have submitted a revised and corrected
statement.

I certify and declare under penalty of perjury that the foregoing is true and correct:

Subscribed on _____, at ____., _____, State of _____.
(date) (city) (county)

The foregoing statement and affidavit are hereby
offered.

_________________________ (Member of Firm must sign here)

_________________________ (Title)

_________________________ (Remaining members of Firm sign here) (Name of Firm)

NOTE: Statement will be returned unless affidavit is completed in EVERY respect.
UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS
SUBCONTRACTOR’S QUALIFICATION STATEMENT

AFFIDAVIT FOR INDIVIDUAL

__________________________ doing business ________________

__________________________
(Name of individual) (Name of Firm)
certifies and says: That he/she is the person submitting this statement of experience:
that he/she has read the same, and that the same is true of his/her own knowledge: that
the statement is for the purpose of inducing the University of Colorado Denver to supply
the submittor with plans and specifications, and that any vendor, or other agency therein
named is hereby authorized to supply the University of Colorado Denver with any
information necessary to verify the statement: and that furthermore, should this
statement at any time cease to properly and truly represent his/her condition in any
substantial respect, it will refrain from further bidding on University work until it shall have
submitted a revised and corrected statement.

I certify and declare under penalty of perjury that the foregoing is true and correct:

Subscribed on _____ at _____. _____, State of ______
(date) (city) (county)

NOTE: Statement will be returned unless
affidavit is completed in EVERY respect. _________________
(Aplicant must sign here)
QUALIFICATION

The University of Colorado Denver will qualify or disqualify a Subcontractor on the basis of:

(1) The information contained in this statement and
(2) Past contract experience with the University.

NOTIFICATION

The University of Colorado Denver will, in writing, notify Contractors of their qualification or disqualification.
SECTION 00 52 53.05 – CONTRACTOR’S DESIGN/BID/BUILD (D/B/B) AGREEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY

A. A sample copy of the above noted form is attached to the end of this section.

1.3 DEFINITIONS (Not Applicable)

1.4 CONTRACTOR’S DESIGN/BID/BUILD (D/B/B) AGREEMENT

A. FORM: State of Colorado form “Contractor’s Design/Bid/Build (D/B/B) Agreement” (SC-6.21).

B. A copy of the above noted document is attached to the end of this section.

1.5 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 52 53.05
# STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

---

## CONTRACTOR'S AGREEMENT
DESIGN/BID/BUILD (D/B/B)

(STATE FORM SC-6.21)

<table>
<thead>
<tr>
<th>STATE AGENCY:</th>
<th>{$Campus}</th>
</tr>
</thead>
<tbody>
<tr>
<td>DEPARTMENT ID:</td>
<td>{$DeptID}</td>
</tr>
<tr>
<td>CONTRACT ID #:</td>
<td>{$ContractID}</td>
</tr>
<tr>
<td>PROJECT #:</td>
<td>21-174017</td>
</tr>
<tr>
<td>PROJECT NAME:</td>
<td>CU Denver Building Electrical System Upgrades</td>
</tr>
<tr>
<td>VENDOR NAME:</td>
<td>{$VendorName}</td>
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</tbody>
</table>

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SC-6.21
Rev. 07/2022 v.1
CU V5
## STATE OF COLORADO

OFFICE OF THE STATE ARCHITECT

STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT

(STATE FORM SC-6.21)

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Table of Contents for the entire Agreement is located in THE GENERAL CONDITIONS OF THE CONTRACTOR’S DESIGN/BID/BUILD (D/B/B) AGREEMENT (SC-6.23)

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<thead>
<tr>
<th>Section</th>
<th>Page</th>
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<tr>
<td><strong>SIGNATURE PAGE</strong></td>
<td>1</td>
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<tr>
<td><strong>RECITALS:</strong></td>
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<tr>
<td>1  ARTICLE 1  PERFORMANCE OF THE WORK</td>
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<td>2  ARTICLE 2  PROVISIONS OF THE CONTRACT DOCUMENTS</td>
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<tr>
<td>3  ARTICLE 3  TIME OF COMPLETION</td>
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<tr>
<td>4  ARTICLE 4  ESSENTIAL CONDITION</td>
<td>3</td>
</tr>
<tr>
<td>5  ARTICLE 5  CONTRACT SUM</td>
<td>3</td>
</tr>
<tr>
<td>6  ARTICLE 6  CONTRACT DOCUMENTS</td>
<td>3</td>
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<tr>
<td>7  ARTICLE 7  OPTIONAL PROVISIONS AND ELECTIONS</td>
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<td>7.1 MODIFICATION OF ARTICLE 2: Execution, Correlation, Intent of Documents, Communication and Cooperation</td>
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<tr>
<td>7.2 MODIFICATION 1 OF ARTICLE 27: Labor and Wages</td>
<td>4</td>
</tr>
<tr>
<td>7.3 MODIFICATION 2 OF ARTICLE 27: Labor and Wages</td>
<td>4</td>
</tr>
<tr>
<td>7.4 MODIFICATION OF ARTICLE 39: Non-Binding Dispute Resolution – Facilitated Negotiations</td>
<td>4</td>
</tr>
<tr>
<td>7.5 MODIFICATION OF ARTICLE 45: Guarantee Inspections After Completion</td>
<td>4</td>
</tr>
<tr>
<td>7.6 MODIFICATION OF ARTICLE 46: Time of Completion and Liquidated Damages</td>
<td>4</td>
</tr>
<tr>
<td>8  ARTICLE 8  NOTICE IDENTIFICATION</td>
<td>5</td>
</tr>
<tr>
<td>EXHIBIT A: CONTRACTORS BID</td>
<td>A</td>
</tr>
<tr>
<td>EXHIBIT B: PERFORMANCE BOND</td>
<td>B</td>
</tr>
<tr>
<td>EXHIBIT C: LABOR AND MATERIAL PAYMENT BOND</td>
<td>C</td>
</tr>
<tr>
<td>EXHIBIT D: INSURANCE CERTIFICATE(S)</td>
<td>D</td>
</tr>
<tr>
<td>EXHIBIT E: BUILDING CODE COMPLIANCE POLICY</td>
<td>E</td>
</tr>
<tr>
<td>EXHIBIT G: APPLICABLE PREVAILING WAGE DETERMINATIONS AND APPRENTICESHIP CONTRIBUTIONS RATES</td>
<td>G</td>
</tr>
<tr>
<td>EXHIBIT H: APPRENTICESHIP UTILIZATION CERTIFICATIONS</td>
<td>H</td>
</tr>
<tr>
<td>EXHIBIT I: GENERAL CONDITIONS OF THE CONTRACTOR’S DESIGN/BID/BUILD (D/B/B) AGREEMENT (STATE FORM SC-6.23)</td>
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<td>EXHIBIT M: SUPPLEMENTARY GENERAL CONDITIONS: FEDERAL PROVISIONS</td>
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</tr>
<tr>
<td>EXHIBIT S: UNIVERSITY OF COLORADO DENVER</td>
<td>ANSCHUTZ MEDICAL CAMPUS SUPPLEMENTARY GENERAL CONDITIONS</td>
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<td>EXHIBIT T: STATE SALES AND USE TAX DOCUMENTS</td>
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<td>EXHIBIT Y: SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS AND MINORITY/WOMEN BUSINESS ENTERPRISE PARTICIPATION REPORT</td>
<td>Y</td>
</tr>
<tr>
<td>EXHIBIT Z: MISCELLANEOUS DOCUMENTS</td>
<td>Z</td>
</tr>
</tbody>
</table>
SIGNATURE PAGE

THE PARTIES HERETO HAVE EXECUTED THIS CONTRACT
Each person signing this Agreement represents and warrants that the signee is duly authorized to execute this Agreement and to bind the Party authorizing such signature.

*Persons signing for Contractor hereby swear and affirm that they are authorized to act on Contractor’s behalf and acknowledge that the State is relying on their representations to that effect. Principal is not a recognized title and will not be accepted.

<table>
<thead>
<tr>
<th>Project Number/Name:</th>
<th>21-174017/ CU Denver Building Electrical System Upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS Contract ID No.:</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CONTRACTOR</strong></th>
<th><strong>STATE OF COLORADO</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>{VendorName}</td>
<td>{CampusLegalName}</td>
</tr>
<tr>
<td>By: {VendorSignerName}, {VendorSignerTitle}</td>
<td>By: {PRName}, {PTitle}</td>
</tr>
<tr>
<td>Date: __________________</td>
<td>Date: __________________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>DEPARTMENT OF PERSONNEL &amp; ADMINISTRATION</strong></th>
<th><strong>STATE BUILDINGS PROGRAM State Architect</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>{StateDelegateName}, {StateDelegateTitle}</td>
<td>(or authorized delegate)</td>
</tr>
<tr>
<td>By: {StateDelegateName}, {StateDelegateTitle}</td>
<td></td>
</tr>
<tr>
<td>Date: __________________</td>
<td></td>
</tr>
</tbody>
</table>

In accordance with §24-30-202, C.R.S., this Contract is not valid until signed and dated below by the State Controller (or an authorized delegate) or the Financial Officer per the Fiscal Rules of the individual Institution of Higher Education.

<table>
<thead>
<tr>
<th>{FinanceSignerTitle}</th>
</tr>
</thead>
<tbody>
<tr>
<td>By: __________________</td>
</tr>
<tr>
<td>{FinanceSignerName}, {FinanceSignerTitle} or Delegate</td>
</tr>
<tr>
<td>Effective Date: __________________</td>
</tr>
</tbody>
</table>

SC-6.21
Rev. 03/2023 v.01
STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM  

CONTRACTOR'S DESIGN/BID/BUILD (D/B/B) AGREEMENT  
(STATE FORM SC-6.21)  

Department ID:  \{\$DeptID\}  
Contract ID:  \{\$ContractID\}  
Project #:  21-174017  

1. PARTIES. THIS AGREEMENT is entered into by and between the STATE OF COLORADO, acting by and through the \{\$CampusLegalName\} hereinafter referred to as the State or Principal Representative, and \{\$VendorName\} having its offices at \{\$VendorAddress\} hereinafter referred to as the Contractor.  

2. EFFECTIVE DATE AND NOTICE OF NONLIABILITY. This Agreement shall not be effective or enforceable until it is approved and signed by the State Controller or its designee (hereinafter called the “Effective Date”), but shall be effective and enforceable thereafter in accordance with its provisions. The State shall not be bound by any provision of this Contract before the Effective Date, and shall have no obligation to pay Contractor for any Work performed or expense incurred before the Effective Date.  

RECITALS:  

WHEREAS, the Principal Representative intends to procure \{\$ProjectNumber\} / \{\$ProjectName\}, \{\$ProjectDescription\}, hereinafter called the Project; and  

WHEREAS, authority exists in the Law and Funds have been budgeted, appropriated, and otherwise made available, and a sufficient unencumbered balance thereof remains available for payment.  

WITNESSETH, that the State of Colorado and the Contractor agree as follows:  

ARTICLE 1 PERFORMANCE OF THE WORK  

The Contractor shall perform all of the Work required for the complete and prompt execution of everything described or shown in, or reasonably implied from the Contract Documents for the above referenced Project.  

ARTICLE 2 PROVISIONS OF THE CONTRACT DOCUMENTS  

The Contractor agrees to perform the Work to the highest industry standards and to the satisfaction of the State of Colorado and its contractor in strict accordance with the provisions of the Contract Documents.  

ARTICLE 3 TIME OF COMPLETION  

The Contractor agrees to Substantially Complete the Project within \{\$SubstantialCompleteDays\} calendar days from the date of the Notice to Proceed, in addition, the Contractor agrees to finally complete the Project from Substantial Completion to Final Acceptance within
\{FinalCompletionDays\} calendar days for a total time of completion of the entire Project of \{TotalCompletionDates\} calendar days. The Contractor shall perform the Work with due diligence to completion.

**ARTICLE 4 ESSENTIAL CONDITION**

Timely completion of the Project is an essential condition of this Agreement. The Contractor shall be subject to any liquidated damages described in Article 7.6 for failure to satisfactorily complete the Work within the time periods in Article 3 above.

**ARTICLE 5 CONTRACT SUM**

The Contractor shall be paid for the performance of this Agreement, subject to any additions and deductions as provided for in Articles 32, 34 and 35 of The General Conditions of the Construction Contract SC-6.23, the sum of \{AgmtTotalWritten\} Dollars and NO/100* \{AgmtTotalNumeric\}.

<table>
<thead>
<tr>
<th>Description of Work/Date</th>
<th>Dollar Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Contract Amount</td>
<td>{AgmtTotalNumeric}</td>
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<tr>
<td>Alt. #01</td>
<td></td>
</tr>
<tr>
<td>Alt. #02</td>
<td></td>
</tr>
<tr>
<td>Total Contract Sum</td>
<td>{AgmtTotalNumeric}</td>
</tr>
</tbody>
</table>

**ARTICLE 6 CONTRACT DOCUMENTS**

The Contract Documents, as enumerated in Article 1.1 of The General Conditions of the Contractor’s Design/Bid/Build (D/B/B) Agreement SC-6.23, are all essential parts of this Agreement and are fully incorporated herein.

**ARTICLE 7 OPTIONAL PROVISIONS AND ELECTIONS**

The provisions of this Article 7 alter the Articles (The General Conditions of the Contractor’s Design/Bid/Build Agreement SC-6.23) or enlarge upon them as indicated:

The Principal Representative and or the State Buildings Program shall mark boxes and initial where applicable.

**MODIFICATION OF ARTICLE 2:** Execution, Correlation, Intent of Documents, Communication and Cooperation.

If the box below is marked, certification of apprenticeship utilization is required for all mechanical, sheet metal, fire suppression, sprinkler fitting, electrical and plumbing work on the project.
☐  _____ Principal Representative initial

MODIFICATION 1 OF ARTICLE 27: Labor and Wages

If the box is marked, the Federal Davis-Bacon Act shall be applicable to the Project. The minimum wage rates to be paid on the Project shall be furnished by the Principal Representative and included in the Contract Documents.

☐  _____ Principal Representative initial

MODIFICATION 2 OF ARTICLE 27: Labor and Wages

If the box is marked, the State prevailing wage statute shall be applicable to the Project. The minimum wage rates to be paid on the Project shall be furnished by the Principal Representative and included in the Contract Documents.

☐  _____ Principal Representative initial

MODIFICATION OF ARTICLE 39: Non-Binding Dispute Resolution – Facilitated Negotiations

If the box is marked, and initialed by the State as noted, the requirement to participate in facilitated negotiations shall be deleted from this Contract. Article 39, Non-Binding Dispute Resolution – Facilitated Negotiations, shall be deleted in its entirety and all references to the right to the same where ever they appear in the contract shall be similarly deleted.

The box may be marked only for projects with an estimated value of less than $500,000.

☐  _____ Principal Representative initial

MODIFICATION OF ARTICLE 45: Guarantee Inspections After Completion

If the box below is marked the six month guarantee inspection is not required.

☐  _____ Principal Representative initial

MODIFICATION OF ARTICLE 46: Time of Completion and Liquidated Damages

If an amount is indicated immediately below, liquidated damages shall be applicable to this Project as, and to, the extent shown below. Where an amount is indicated below, liquidated damages shall be assessed in accordance with and pursuant to the terms of The General Conditions of the Design/Bid/Build Agreement Article 46, Time of Completion And Liquidated Damages, in the amounts and as here indicated. The election of liquidated damages shall limit and control the parties right to damages as the State’s sole and exclusive remedy for delay.

Inability To Use The Project

For the inability to use the Project, for each day after the number of calendar days specified in the Contractor’s bid for the Project and the Agreement for achievement of Substantial Completion, until the day that the Project has achieved Substantial Completion and the Notice of Substantial Completion is issued, the Contractor agrees that an amount equal \([\text{SLDsWritten} \text{ DOLLARS (S[SLDsNumeric])}]\) shall be assessed against Contractor from amounts due and payable to the Contractor under the Contract, or the Contractor and the Contractor’s Surety shall pay to the Principal Representative such sum for any deficiency, if amounts on account thereof are deducted
from remaining amounts due, but amounts remaining are insufficient to cover the entire assessment.

Damages Related to Extended Closeout

For damages related to or arising from additional administrative, technical, supervisory and professional expenses related to and arising from the extended closeout period, for each day in excess of the number of calendar days specified in the Contractor’s bid for the Project and the Agreement to finally complete the Project as defined by the issuance of the Notice of Final Acceptance (after the issuance of the final Notice of Substantial Completion), the Contractor agrees that an amount equal to \( \$ \{\text{LDsWrittenFinalCompletion} \} \) DOLLARS \( \$ \{\text{LDsNumericFinalCompletion} \} \) shall be assessed against Contractor from amounts due and payable to the Contractor under the Contract, or the Contractor and the Contractor’s Surety shall pay to the Principal Representative such sum for any deficiency, if amounts on account thereof are deducted from remaining amounts due but amounts remaining are insufficient to cover the entire assessment.

ARTICLE 8       NOTICE IDENTIFICATION

All Notices pertaining to General Conditions or otherwise required to be given shall be transmitted in writing, to the individuals at the addresses listed below, and shall be deemed duly given when received by the parties at their addresses below or any subsequent persons or addresses provided to the other party in writing.

NOTICE TO PRINCIPAL REPRESENTATIVE:

\{\text{SPRName}, \text{SPRTitle} \}
\{\text{SPRAAddress} \}
\{\text{SPRepEmail} \}

With copies to State Buildings Program (or Delegate)

\{\text{StateDelegateName}, \text{StateDelegateTitle} \}
\{\text{StateDelegateAddress} \}
\{\text{StateDelegateEmail} \}

NOTICE TO CONTRACTOR:

\{\text{VendorSignerName} \}
\{\text{VendorAddress} \}
\{\text{VendorSignerEmail} \}

With copies to:

\{\text{VendorRepName}, \text{VendorRepEmail} \}
\{\text{PMName}, \text{PMEmail} \}

File
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT A: CONTRACTORS BID

CONTRACTOR'S BID (Form SBP-6.13)
Bid Alternates (Form SBP-6.131)
Unit Pricing (Form SBP-6.133)
Bid Bond (Form SBP-6.14)
Labor Burden Calculation (Form SBP-6.18)
Wage Rate Schedule

[Include all the items above in Exhibit A. If an item does not apply, strike it from the list above.]
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT B: PERFORMANCE BOND

PERFORMANCE BOND (Form SC-6.22)
Required for projects valued at $150,000 or greater.
BONDBING COMPANY: DO NOT MAKE ANY CHANGES TO THE LANGUAGE IN THIS BOND.

KNOW ALL PERSONS BY THESE PRESENTS:

That the Contractor

as Principal and hereinafter called “Principal,”

and

as Surety and hereinafter called “Surety,” a corporation organized and existing under the laws of

__________________________ are held and firmly bound unto the STATE OF COLORADO acting by and through the Institution/Agency identified above hereinafter called the “Principal Representative”, in the sum of:

\[\text{\$AgmtTotalWritten} \, \text{Dollars (\$AgmtTotalNumeric)}\]

\[\text{(Written Amount)} \, \text{(Numerical Amount)}\]

for the payment whereof the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly, by these presents.

WHEREAS, the Principal and the State of Colorado acting by and through the Principal Representative have entered into a certain Contract, hereinafter called “Contract,” dated

__________________________ for the construction of a PROJECT

\[\text{(Leave blank, to be completed by Institution/Agency)}\]

identified above, which Contract is hereby by reference made a part hereof;
NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION, is such that, if the Principal shall promptly, fully and faithfully perform all the undertakings, covenants, terms, conditions and agreements of said Contract during the original term of said Contract any extensions thereof that may be granted by the Principal Representative with or without notice to the Surety, and during the life of any guaranty required under the Contract, and shall also well and truly perform and fulfill all undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications to the Surety being hereby waived, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

AND THE SAID SURETY, for value received hereby stipulates and agrees that whenever the Principal shall be, and declared by the Principal Representative to be in default under said Contract, the State of Colorado having performed its obligations thereunder, the Surety may promptly remedy the default or shall promptly (1) Complete the Contract in accordance with its terms and conditions, or (2) Obtain a bid or bids for submittal to the Principal Representative for completing the Contract in accordance with its terms and conditions, and upon determination by the Principal Representative and Surety of the lowest responsible bidder, arrange for a contract between such bidder and the State of Colorado acting by and through the Principal Representative and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion, less the balance of the contract price but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount hereinafter set forth. The term “balance of the contract price” as herein used shall mean the total amount payable to the Principal under the Contract and any amendments thereto, less the amount properly paid by the State of Colorado to the Contractor.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the State of Colorado.

IN WITNESS WHEREOF said Principal and Surety have executed this Bond, on

(Corporate Seal)                      THE PRINCIPAL

ATTEST:

By:                      Title:

Secretary

(Corporate Seal)                      SURETY

By:                      Attorney-in-fact

THIS BOND MUST BE ACCOMPANIED BY POWER OF ATTORNEY, EFFECTIVELY DATED

Note: This bond is issued simultaneously with another bond conditioned for the full and faithful payment for all labor and material of the contract.
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT C: LABOR AND MATERIAL PAYMENT BOND

LABOR AND MATERIAL PAYMENT BOND (Form SC-6.221)
Required for projects valued at $150,000 or greater.
## Colorado Labor and Material Bond

<table>
<thead>
<tr>
<th>Institution/Agency:</th>
<th>$(Campus) / $(DeptID)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project No./Name:</td>
<td>$(ProjectNumber) / $(ProjectName)</td>
</tr>
</tbody>
</table>

---

**BONDING COMPANY: DO NOT MAKE ANY CHANGES TO THE LANGUAGE IN THIS BOND.**

### KNOW ALL PERSONS BY THESE PRESENTS:

That the Contractor

as Principal and hereinafter called "Principal,"

and

as Surety and hereinafter called “Surety,” a corporation organized and existing under the laws of

_____________ are held and firmly bound unto the **STATE OF COLORADO** acting by and through the

Institution/Agency identified above hereinafter called “Principal Representative,” and to all subcontractors

and any others who have supplied or furnished or shall supply or furnish materials, rental machinery, tools,

or equipment actually used in the performance of the hereinafter identified Contract, or who have performed

or shall perform labor in the performance of or in connection with said Contract, hereinafter called "Obligees" in

the sum of:

\[
\text{\{AgmtTotalWritten\} Dollars (\{AgmtTotalNumeric\)}
\]

\[(\text{Written Amount}) (\text{Numerical Amount})\]

together with interest at the rate of eight per cent (8%) per annum on all payments becoming due in

accordance with said Contract, from the time such payments shall become due until such payment shall be

made, for the payment of which, well and truly made to the Obligees, the Principal and the Surety bind

themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly, by

these presents.

**WHEREAS**, the Principal and the State of Colorado acting by and through the Principal Representative

have entered into a certain Contract, hereinafter called "Contract," dated

_____________ for the construction of a PROJECT

(Leave blank, to be completed by Institution/Agency)

identified above, which Contract is hereby by reference made a part hereof;

---

SC-6.221
(Rev. 7/2022 R1)
NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal and the Surety shall fully indemnify and save harmless the State of Colorado and the Principal Representative from and against any and all costs and damages, including patent infringements, which either may suffer by reason of any failure or failures of the Principal promptly and faithfully to perform all terms and conditions of said Contract and shall fully reimburse and repay the State of Colorado and the Principal Representative all outlay and expense which the State of Colorado and the Principal Representative may incur in making good any such failure or failures, and further, if the Principal and his subcontractors shall duly and promptly pay for any and all labor, materials, team hire, sustenance, provisions, provender, rental machinery, tools, or equipment and other supplies which have been or shall be used or consumed by said Principal or his subcontractors in the performance of the work of said Contract, and it said Principal shall duly and promptly pay all his subcontractors the sums due them for any and all materials, rental machinery, tools, or equipment and labor that have been or shall be furnished, supplied, performed or used in connection with performance of said Contract, and shall also fully indemnify and save harmless the State of Colorado and the Principal Representative to the extent of any and all expenditures which either or both of them may be required to make by reason of any failures or defaults by the Principal or any subcontractor in connection with such payments; then this obligation shall be null and void, otherwise it shall remain in full force and effect.

It is expressly understood and agreed that any alterations which may be made in the terms of said Contract or in the work to be done under said Contract, or any extension(s) of time for the performance of the Contract, or any forebearance on the part of either the State of Colorado or the Principal to any of the others, shall not in any way release the Principal and the Surety, or either of them, their heirs, executors, administrators, successors or assigns from their liability hereunder, notice to the Surety of any such alteration, extension or forebearance being hereby waived.

IN WITNESS WHEREOF, the Principal and the Surety have executed this Bond, , on

(If left blank, the Institution/Agency will date this bond to match the Contract date)

(Corporate Seal)                              THE PRINCIPAL

ATTEST:

__________________________________________
By: ________________________________________
Title: ______________________________________

Secretary                              SURETY

__________________________________________
By: ________________________________________
Attorney-in-fact

This bond is issued simultaneously with another bond conditioned for the full and faithful performance of the contract.

THIS BOND MUST BE ACCOMPANIED BY POWER OF ATTORNEY, EFFECTIVELY DATED
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR’S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT D: INSURANCE CERTIFICATE(S)

INSURANCE CERTIFICATE(S) (attached)
# Certificate of Liability Insurance

This certificate is issued as a matter of information only and confers no rights upon the certificate holder. This certificate does not affirmatively or negatively amend, extend or alter the coverage afforded by the policies below. This certificate of insurance does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder.

**Important:** If the certificate holder is an Additional Insured, the policy(ies) must have Additional Insured provisions or be endorsed. If Subrogation is waived, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

### Producer
- **Contact:**
  - **Name:** [Name]
  - **Phone:** [Phone]
  - **Fax:** [Fax]
  - **E-mail:** [E-mail]

### Insured
- **Insured Name:** [Insured Name]
- **Insured Address:** [Insured Address]
- **Insured City, State, Zip Code:** [Insured City, State, Zip Code]

### Insurer(S) Affording Coverage
- **Insurer A:** [Insurer A]
- **Insurer B:** [Insurer B]
- **Insurer C:** [Insurer C]
- **Insurer D:** [Insurer D]
- **Insurer E:** [Insurer E]
- **Insurer F:** [Insurer F]

### Coverages

<table>
<thead>
<tr>
<th>Insr. Ltr.</th>
<th>Type of Insurance</th>
<th>Addl. Subs. Wd.</th>
<th>Policy Number</th>
<th>Policy Eff. Date</th>
<th>Policy Exp. Date</th>
<th>Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Commercial General Liability</td>
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<td>Y</td>
<td>01/01/2019</td>
<td>01/01/2020</td>
<td>$1,000,000</td>
</tr>
<tr>
<td></td>
<td>Pollution Liability</td>
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<td>01/01/2019</td>
<td>01/01/2020</td>
<td>$1,000,000</td>
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<td>B</td>
<td>Automobile Liability</td>
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<td>01/01/2019</td>
<td>01/01/2020</td>
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<td>Umbrella Liability</td>
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<td>01/01/2020</td>
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<td>01/01/2020</td>
<td>$1,000,000</td>
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<td>D</td>
<td>Workers Compensation and Employers’ Liability</td>
<td>Y</td>
<td>01/01/2019</td>
<td>01/01/2020</td>
<td>$100,000</td>
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</tr>
<tr>
<td>E</td>
<td>Professional Liability</td>
<td>Y</td>
<td>01/01/2019</td>
<td>01/01/2020</td>
<td>$2,000,000</td>
<td></td>
</tr>
</tbody>
</table>

### Description of Operations / Locations / Vehicles

The Regents of the University of Colorado, a Body Corporate are named as Additional Insured as respects General, Pollution and Automobile Liability policies.

The Automobile, Workers Compensation and Professional Liability policies are endorsed to include a Waiver of Subrogation in favor of The Regents of the University of Colorado, a Body Corporate.

### Certificate Holder

The Regents of the University of Colorado
Attn: Project Management
1945 North Wheeling Street, Campus Mail stop F-418
Aurora, CO 80045

### Cancellation

Should any of the above described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

Authorized Representative
Authorized Representative Signature

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EVIDENCE OF PROPERTY INSURANCE

THIS EVIDENCE OF PROPERTY INSURANCE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERNS NO RIGHTS UPON THE ADDITIONAL INTEREST NAMED BELOW. THIS EVIDENCE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS EVIDENCE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE ADDITIONAL INTEREST.

AGENCY
COMPANY
ADDRESS
CITY, STATE, ZIP CODE

INSURANCE COMPANY

FAX
[AG. No.]:
E-MAIL
ADDRESS:
CODE:
SUB CODE:

AGENCY
CUSTOMER ID:
INSURED
INSURED NAME
INSURED ADDRESS
INSURED CITY, STATE, ZIP CODE

LOAN NUMBER
POLICY NUMBER
POLICY NUMBER

EFFECTIVE DATE
01/01/2019
EXPIRATION DATE
01/01/2020
CONTINUED UNTIL
TERMINATED IF CHECKED

THIS REPLACES PRIOR EVIDENCE DATED:

PROPERTY INFORMATION

LOCATION/DESCRIPTION

LOCATION OF PROJECT
 Builders Risk is required for new buildings or alterations to existing buildings
 and for materials and equipment to be installed in existing structures.

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS EVIDENCE OF PROPERTY INSURANCE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

COVERAGE INFORMATION

PERILS INSURED
BASIC
BROAD
 SPECIAL

AMOUNT OF INSURANCE
DEDUCTIBLE

COVERAGES / PERILS / FORMS
 Builders Risk - 100% of Completed Value
 100% Project Value
 $50,000 or less

REMARKS (Including Special Conditions)

RE: Specific Project

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

ADDITIONAL INTEREST

NAME AND ADDRESS

The Regents of the University of Colorado
Attn: Project Management
1945 North Wheeling Street, Campus Mail stop F-418
Aurora, CO 80045

ADDITIONAL INSURED
MORTGAGEE
LOAN #

LENDER'S LOSS PAYABLE
Waiver of Subrogation

LOSS PAYEE

AUTHORIZED REPRESENTATIVE
AUTHORIZED REPRESENTATIVE SIGNATURE

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STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT E: BUILDING CODE COMPLIANCE POLICY

BUILDING CODE COMPLIANCE POLICY: COORDINATION OF APPROVED BUILDING CODES, PLAN REVIEWS AND BUILDING INSPECTIONS (as applicable)

Refer to the Office of the State Architect State Buildings Building Codes Webpage for:

Building Code Compliance Policy (Rev. {BldgCodeComplPolicyDate}); and

Exhibit A of the Building Codes dated (Rev. {ExA_BldgCodeDate}), including the Amendment to Chapter 1 of the International Building Code

The Office of the State Architect’s Building Codes Webpage is available at:

https://osa.colorado.gov/state-buildings/building-codes

The CU Denver | Anschutz Guidelines and Standards for Design and Construction Projects

STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT G: APPLICABLE PREVAILING WAGE DETERMINATIONS AND APPRENTICESHIP CONTRIBUTIONS RATES

APPLICABLE PREVAILING WAGE DETERMINATIONS AND APPRENTICESHIP CONTRIBUTION RATES
(For projects $500,000 and greater)
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT H: APPRENTICESHIP UTILIZATION CERTIFICATIONS

APPRENTICESHIP UTILIZATION CERTIFICATIONS (For projects $1,000,000 and greater)
APPRENTICESHIP UTILIZATION CERTIFICATION
(Public Projects of $1 million or more)

<table>
<thead>
<tr>
<th>Institution/Agency:</th>
<th>{Campus} {Dept\Id}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project No./Name:</td>
<td>{ProjectNumber} {ProjectName}</td>
</tr>
<tr>
<td>General Contractor:</td>
<td>{Vendor\Name}</td>
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For each trade listed below attach documentation that all firms identified participate in apprenticeship programs as described in the Certification Statement below.

<table>
<thead>
<tr>
<th>TRADE</th>
<th>SUBCONTRACTOR</th>
<th>UNION CERTIFICATION</th>
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<tr>
<td>Electrical</td>
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CERTIFICATION STATEMENT § 24-92-115, C.R.S. (SB 19-196)

The above named General Contractor certifies and agrees as follows:

That all firms identified above participate in apprenticeship programs registered with the United States Department of Labor’s Employment and Training Administration or state apprenticeship councils recognized by the United States Department of Labor and have a proven record of graduating apprentices at a minimum of fifteen percent of its apprentices for at least three of the past five years. The General Contractor shall supply supporting documentation from the United States Department of Labor’s office of apprenticeship verifying the certification.

The above documentation shall be made publicly available by the contracting agency through its website within thirty (30) days from when it is submitted.

The General Contractor shall agree to provide additional documentation to the contracting agency regarding affected apprenticeship training programs relating to the requirements above. If a contracting agency determines that a subcontractor has willfully falsified documentation or willfully misrepresented their qualifications, the agency shall direct the General Contractor to terminate the subcontractor contract immediately and the subcontractor will be immediately removed from the public project. At the discretion of the Director of the Department of Personnel, the State may initiate the process to debar the General Contractor pursuant to § 24-109-105, C.R.S., and may pursue any other remedy provided by law.

CERTIFIED and AGREED to this date ____________________________.

GENERAL CONTRACTOR: \{Vendor\Name\}

Full Legal Name
BY: \{Vendor\SignerName\} \{Vendor\SignerTitle\}
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT I: GENERAL CONDITIONS OF THE CONTRACTOR'S DESIGN/BID/BUILD (D/B/B) AGREEMENT
(STATE FORM SC-6.23)
THE GENERAL CONDITIONS OF THE CONTRACTOR’S DESIGN/BID/BUILD (D/B/B) AGREEMENT
(STATE FORM SC-6.23)
# THE GENERAL CONDITIONS OF THE CONTRACTOR’S DESIGN/BID/BUILD AGREEMENT

(State Form SC-6.23)

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STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

THE GENERAL CONDITIONS OF THE CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.23)

PART 4 - ARTICLE 1   DEFINITIONS

SCHEDULE 0 - CONTRACT DOCUMENTS

The Contract Documents consist of the following some of which are procedural documents used in the administration and performance of the Agreement:

a) Contractor’s Design/Bid/Build Agreement; (SC-6.21);
b) Performance Bond (SC-6.22) and Labor and Material Payment Bond (SC-6.221);
c) General Conditions of the Contractor’s Design/Bid/Build Agreement (SC- 6.23)
d) and if applicable, Supplementary General Conditions;
e) Detailed Specification Requirements, including all addenda issued prior to the opening of the bids; and,
f) Drawings, including all addenda issued prior to the opening of the bids.
g) Change Orders (SC-6.31) and Amendments (SC-6.0), if any, when properly executed.
h) Authorization to Bid (SBP-6.10)
i) Information for Bidders (SBP-6.12);
j) Bid (SBP-6.13), Bid Alternates, (SBP-6.131) and Unit Pricing (SBP-6.133) if applicable
k) Bid Bond (SBP-6.14);
l) Labor Burden Calculation (SBP-6.18)
m) Notice of Award (SBP-6.15);
n) Builder’s risk insurance certificates of insurance (ACORD 25-S);
o) Liability and Workers’ compensation certificates of insurance;
p) Notice to Proceed (Design/Bid/Build) (SBP-6.26);
q) Notice of Approval of Occupancy/Use (SBP-01);
r) Notice of Partial Substantial Completion (SBP-071);
s) Notice of Substantial Completion (SBP-07);
t) Notice of Partial Final Acceptance (SC-6.27);
u) Notice of Final Acceptance (SBP-6.271);
v) Notice of Partial Contractor’s Settlement (SC-7.3);
w) Notice of Contractor’s Settlement (SBP-7.31);
x) Application and Certificate for Contractor’s Payment (SBP-7.2);
y) Other Procedural and Reporting Documents or Forms

Other procedural and reporting documents or forms referred to in the General Conditions, the Supplementary General Conditions, the Specifications or required by the State Buildings Program or the Principal Representative, including but not necessarily limited to Pre-Acceptance Check List (SBP-05) and the Building Inspection Record (SBP-BIR). A list of the current standard State Buildings Program forms applicable to this Contract may be obtained from the Principal Representative on request.
SCHEDULE 1 - DEFINITIONS OF WORDS AND TERMS USED

Agreement
The term “Agreement” shall mean the written agreement entered into by the State of Colorado acting by and through the Principal Representative and the Contractor for the performance of the Work and payment therefore, on State Form SC-6.21. The term Agreement when used without reference to State Form SC-6.21 may also refer to the entirety of the parties’ agreement to perform the Work described in the Contract Documents or reasonably inferable there from. The term “Contract” shall be interchangeable with this latter meaning of the term Agreement.

Amendment
The term “Amendment” means a written order signed by the Principal Representative or its authorized agent, issued after the execution of this Agreement, authorizing a change in the Work, the method or manner of performance, an adjustment in the Contract Sum, or the Contract Time as required by State Building Program’s policy Contract Modification Guidelines.

Architect/Engineer
The term “Architect/Engineer” shall mean either the architect of record or the engineer of record under contract to the State of Colorado for the Project identified in the Contract Documents.

Change Order
The term “Change Order” means a written order directing the Contractor to make changes in the Work, in accordance with Article 35L, The Value of Changed Work.

Colorado Labor
The term "Colorado labor", as provided in C.R.S. § 8-17-101(2)(a), as amended, means any person who is a resident of the state of Colorado, at the time of the public Works project, without discrimination as to race, color, creed, sex, sexual orientation, marital status, national origin, ancestry, age, or religion except when sex or age is a bona fide occupational qualification. A resident of the state of Colorado is a person who can provide a valid Colorado driver’s license, a valid Colorado state-issued photo identification, or documentation that he or she has resided in Colorado for the last thirty days.

Contractor
The word “Contractor” shall mean the person, company, firm, corporation or other legal entity entering into a contract with the State of Colorado acting by and through the Principal Representative

Days
The term “days” whether singular or plural shall mean calendar days unless expressly stated otherwise. Where the term “business days” is used it shall mean business days of the State of Colorado.

Drawings
The term “Drawings” shall mean all drawings approved by appropriate State officials which have been prepared by the Architect/Engineer showing the Work to be done, except that where a list of drawings is specifically enumerated in the Supplementary General Conditions or division 1 of the Specifications, the term shall mean the drawings so enumerated, including all addenda drawings.
Emergency Field Change Order
The term “Emergency Field Change Order” shall mean a written change order for extra Work or a change in the Work necessitated by an emergency as defined in Article 35.4 executed on State form SC 6.31 and identified as an Emergency Field Change Order. The use of such orders is limited to emergencies and to the amounts shown in Article 35.4.

Final Acceptance
The terms “final acceptance” or “finally complete” mean the stage in the progress of the Work, after substantial completion, when all remaining items of Work have been completed, all requirements of the Contract Documents are satisfied and the Notice of Acceptance can be issued. Discrete physical portions of the Project may be separately and partially deemed finally complete at the discretion of the Principal Representative when that portion of the Project reaches such stage of completion and a partial Notice of Acceptance can be issued.

Fixed Limit of Construction Cost
The term “Fixed Limit of Construction Cost” shall set forth a dollar amount available for the total Construction Cost of all elements of the Work as specified by the Principal Representative.

Notice
The term “Notice” shall mean any communication in writing from either contracting party to the other by such means of delivery that receipt cannot properly be denied. Notice shall be provided to the person identified to receive it in Article 8 of the Agreement. Notice Identification, or to such other person as either party identifies in writing to receive Notice Notwithstanding an email delivery or return receipt, email Notice shall not be adequate. Acknowledgment of receipt of a voice message shall not be deemed to waive the requirement that Notice, where required, shall be in writing.

Occupancy
The term “Occupy” means occupancy taken by the State as Owner after the Date of Substantial Completion at a time when a building or other discrete physical portion of the Project is used for the purpose intended. The Date of Occupancy shall be the date of such first use, but shall not be prior to the date of execution of the Notice of Approval of Occupancy/Use. Prior to the date of execution of a Notice of Approval of Occupancy/Use, the state shall have no right to occupy and the project may not be considered safe for occupancy for the intended use.

Owner
The term “Owner” shall mean the Principal Representative.

Principal Representative
The term “Principal Representative” shall be defined, as provided in C.R.S. § 24-30-1301(14), as the governing board of a state department, institution, or agency; or if there is no governing board, then the executive head of a state department, institution, or agency, as designated by the governor or the general assembly and as specifically identified in the Contract Documents, or shall have such other meaning as the term may otherwise be given in C.R.S. § 24-30-1301(14), as amended. The Principal Representative may delegate authority. The Contractor shall have the right to inquire regarding the delegated authority of any of the Principal Representative’s representatives on the project and shall be provided with a response in writing when requested.

Product Data

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The term “Product Data” shall mean all submittals in the form of printed manufacturer’s literature, manufacturer’s specifications, and catalog cuts.

Project
The “Project” is the total construction of which the Work performed under the Contract Documents is a part, and may include construction by the Principal Representative or by separate contractors.

Reasonably Inferable
The phrase “reasonably inferable” means that if an item or system is either shown or specified, all material and equipment normally furnished with such items or systems and needed to make a complete installation shall be provided whether mentioned or not, omitting only such parts as are specifically excepted, and shall include only components which the Contractor could reasonably anticipate based on his or her skill and knowledge using an objective, industry standard, not a subjective standard. This term takes into consideration the normal understanding that not every detail is to be given on the Drawings and Specifications If there is a difference of opinion, the Principal Representative shall make the determination as to the standards of what reasonably inferable.

Samples
The term “Samples” shall mean examples of materials or Work provided to establish the standard by which the Work will be judged.

SBP
The term "SBP" means "State Buildings", which is used in connection with labeling applicable State form documents (e.g., "SBP-01" is the form number for Notice of Approval of Occupancy/Use).

SC
The term "SC" means "State Contract" which is used in connection with labeling applicable State form documents (e.g. "SC 6.23" is the State form number for these General Conditions of the Contractor’s Design/Bid/Build Agreement).

Schedule of Values
The term “Schedule of Values” is defined as the itemized listing of description of the Work by Division and Section of the Specifications. The format shall be the same as Form SC-7.2. Included shall be the material costs, and the labor and other costs plus the sum of both.

Shop Drawings
The term “Shop Drawings” shall mean any and all detailed drawings prepared and submitted by Contractor, Subcontractor at any tier, vendors or manufacturers providing the products and equipment specified on the Drawings or called for in the Specifications.

Specifications
The term “Specifications” shall mean the requirements of the CSI divisions of the project manual prepared by the Architect/Engineer describing the Work to be accomplished.

State Buildings Program
Shall refer to the Office of the State Architect within the Department of Personnel & Administration of Colorado State government responsible for project administration, review, approval and coordination of plans, construction procurement policy, contractual procedures, and code compliance and inspection of all buildings, public works and improvements erected for state purposes; except public roads and highways and projects under the supervision of the division of wildlife and the division of parks and outdoor recreation as provided in C.R.S. § 24-30-1301, et seq. The term State Buildings Program shall also mean that individual within a State Department agency or institution, including institutions of higher education, who has signed an agreement accepting delegation to perform all or part of the responsibilities and functions of State Buildings Program.

Subcontractor
The term “Subcontractor” shall mean a person, firm or corporation supplying labor, materials, equipment and/or Services for Work at the site of the Project for, and under separate contract or agreement with the Contractor.

Submittals
The term “submittals” means drawings, lists, tables, documents and samples prepared by the Contractor to facilitate the progress of the Work as required by these General Conditions or the Drawings and Specifications. They consist of Shop Drawings, Product Data, Samples, and various administrative support documents including but not limited to lists of subcontractors, construction progress schedules, schedules of values, applications for payment, inspection and test results, requests for information, various document logs, and as-built drawings. Submittals are required by the Contract Documents, but except to the extent expressly specified otherwise are not themselves a part of the Contract Documents.

Substantial Completion
The terms “substantial completion” or “substantially complete” mean the stage in the progress of the Work when the construction is sufficiently complete, in accordance with the Contract Documents as modified by any Change Orders, so that the Work, or at the discretion of the Principal Representative, any designated portion thereof, is available for its intended use by the Principal Representative and a Notice of Substantial Completion can be issued. Portions of the Project may, at the discretion of the Principal Representative, be designated as substantially complete.

Supplier
The term "Supplier" shall mean any manufacturer, fabricator, distributor, material man or vendor.

Surety
The term “Surety” shall mean the company providing the labor and material payment and performance bonds for the Contractor as obligor.

Value Engineering
“Value Engineering” or “VE” is defined as an analysis and comparison of cost versus value of building materials, equipment, and systems. VE considers the initial cost of construction, coupled with the estimated cost of maintenance, energy use, life expectancy and replacement cost. VE related to this Project shall include the analysis and comparison of building elements in an effort
to reduce overall Project costs, while maintaining or enhancing the quality of the design intent, whenever possible.

Work
The term “Work” shall mean all or part of the labor, materials, equipment, and other services required by the Contract Documents or otherwise required to be provided by the Contractor to meet the Contractor’s obligations under the Contract.

PART 5 - ARTICLE 2 EXECUTION, CORRELATION, INTENT OF DOCUMENTS, COMMUNICATION AND COOPERATION

SCHEDULE 0 - EXECUTION

The Contractor, within ten (10) days from the date of Notice of Award, will be required to:

a) Execute the Agreement, State Form SC-6.21;

b) Furnish fully executed Performance and Labor and Material Payment Bonds on State Forms SC-6.22 and SC-6.221; and

c) Furnish certificates of insurance evidencing all required insurance on standard Acord forms designed for such purpose.

d) Furnish certified copies of any insurance policies requested by the Principal Representative.

e) If Article 7.1 of the Contractor’s Design/Bid/Build Agreement (SC-6.21) applies, furnish documentation that identifies the subcontractors that will be used for all mechanical, sheet metal, fire suppression, sprinkler fitting, electrical, and plumbing work required on the project and certify that all firms identified participate in apprenticeship programs registered with the United States Department of Labor’s Employment and Training Administration or state apprenticeship councils recognized by the United States Department of Labor and have a proven record of graduating a minimum of fifteen percent of its apprentices for at least three of the past five years;

SCHEDULE 1 - CORRELATION

By execution of the Agreement the Contractor represents that the Contractor has visited the site, has become familiar with local conditions and local requirements under which the Work is to be performed, including the building code programs of the State Buildings Program as implemented by the Principal Representative, and has correlated personal observations with the requirements of the Contract Documents.

SCHEDULE 2 - INTENT OF DOCUMENTS

The Contract Documents are complementary, and what is called for by any one document shall be as binding as if called for by all. The intention of the documents is to include all labor, materials, equipment and transportation necessary for the proper execution of the Work. Words describing materials or Work which have a well-known technical or trade meaning shall be held to refer to such recognized standards.

In any event, if any error exists, or appears to exist, in the requirements of the Drawings or Specifications, or if any disagreement exists as to such requirements, the Contractor shall have
the same explained or adjusted by the Architect/Engineer before proceeding with the Work in question. In the event of the Contractor’s failure to give prior written Notice of any such errors or disagreements of which the Contractor or the Subcontractors at any tier are aware, the Contractor shall, at no additional cost to the Principal Representative, make good any damage to, or defect in, Work which is caused by such omission.

Where a conflict occurs between or within standards, Specifications or Drawings, which is not resolved by reference to the precedence between the Contract Documents, the more stringent or higher quality requirements shall apply so long as such more stringent or higher quality requirements are reasonably inferable. The Architect/Engineer shall decide which requirements will provide the best installation.

With the exception noted in the following paragraph, the precedence of the Contract Documents is in the following sequence:

a) The Supplementary General Conditions, if any;
b) The Colorado Special Provisions, Article 52 of this General Conditions of the Contractor’s Design/Bid/Build Agreement (State Form SC-6.23);
c) The Agreement (SC-6.21);
d) The General Conditions (SC-6.23); and
e) Drawings and Specifications, all as modified by any addenda.

Change Orders and Amendments, if any, to the Contract Documents take precedence over the original Contract Documents.

Notwithstanding the foregoing order of precedence, the Special Provisions of Article 52 of the General Conditions, Special Provisions, shall take precedence, rule and control over all other provisions of the Contract Documents.

Unless the context otherwise requires, form numbers in this document are for convenience only. In the event of any conflict between the form required by name or context and the form required by number, the form required by name or context shall control. The Contractor may obtain State forms from the Principal Representative upon request.

SCHEDULE 3 - PARTNERING, COMMUNICATIONS AND COOPERATION

In recognition of the fact that conflicts, disagreements and disputes often arise during the performance of construction contracts, the Contractor and the Principal Representative aspire to encourage a relationship of open communication and cooperation between the employees and personnel of both, in which the objectives of the Contract may be better achieved and issues resolved in a more fully informed atmosphere.

The Contractor and the Principal Representative each agree to assign an individual who shall be fully authorized to negotiate and implement a voluntary partnering plan for the purpose of facilitating open communications between them. Within thirty days (30) of the Notice to Proceed, the assigned individuals shall meet to discuss development of an informal agreement to accomplish these goals.
The assigned individuals shall endeavor to reach an informal agreement, but shall have no such obligation. Any plans these parties voluntarily agree to implement shall result in no change to the contract amount, and no costs associated with such plan or its development shall be recoverable under any contract clause. In addition, no plan developed to facilitate open communication and cooperation shall alter, amend or waive any of the rights or duties of either party under the Contract unless and except by written Amendment to the Contract, nor shall anything in this clause or any subsequently developed partnering plan be deemed to create fiduciary duties between the parties unless expressly agreed in a written Amendment to the Contract. It is also recognized that projects with relatively low contract values may not justify the expense or special efforts required. In the case of small projects with an initial Contract value under $500,000, the requirements of the preceding paragraph shall not apply.

PART 6 - ARTICLE 3   COPIES FURNISHED

The Contractor will be furnished, free of charge, the number of copies of Drawings and Specifications as specified in the Contract Documents, or if no number is specified, all copies reasonably necessary for the execution of the Work.

PART 7 - ARTICLE 4   OWNERSHIP OF DRAWINGS

Drawings or Specifications, or copies of either, furnished by the Architect/Engineer, are not to be used on any other Work. At the completion of the Work, at the written request of the Architect/Engineer, the Contractor shall endeavor to return all Drawings and Specifications.

The Contractor may retain the Contractor’s Contract Document set, copies of Drawings and Specifications used to contract with others for any portion of the Work and a marked up set of as-built drawings.

PART 8 - ARTICLE 5   ARCHITECT/ENGINEER’S STATUS

The Architect/Engineer is the representative of the Principal Representative for purposes of administration of the Contract, as provided in the Contract Documents and the Agreement. In case of termination of employment or the death of the Architect/Engineer, the Principal Representative will appoint a capable Architect/Engineer against whom the Contractor makes no reasonable objection, whose status under the Contract shall be the same as that of the former Architect/Engineer.
PART 9 - ARTICLE 6  ARCHITECT/ENGINEER DECISIONS AND JUDGMENTS, ACCESS TO WORK AND INSPECTION

SCHEDULE 0 - DECISIONS

The Architect/Engineer shall, within a reasonable time, make decisions on all matters relating to the execution and progress of the Work or the interpretation of the Contract Documents, and in the exercise of due diligence shall be reasonably available to the Contractor to timely interpret and make decisions with respect to questions relating to the design or concerning the Contract Documents.

SCHEDULE 1 - JUDGMENTS

The Architect/Engineer is, in the first instance, the judge of the performance required by the Contract Documents as it relates to compliance with the Drawings and Specifications and quality of Workmanship and materials.

The Architect/Engineer shall make judgments regarding whether directed Work is extra or outside the scope of Work required by the Contract Documents at the time such direction is first given. If, in the Contractor’s judgment, any performance directed by the Architect/Engineer is not required by the Contract Documents or if the Architect/Engineer does not make the judgment required, it shall be a condition precedent to the filing of any claim for additional cost related to such directed Work that the Contractor, before performing such Work, shall first obtain in writing, the Architect/Engineer’s written decision that such directed Work is included in the performance required by the Contract Documents. If the Architect/Engineer’s direction to perform the Work does not state that the Work is within the performance required by the Contract Documents, the Contractor shall, in writing, request the Architect/Engineer to advise in writing whether the directed Work will be considered extra Work or Work included in the performance required by the Contract Documents.

The Architect/Engineer shall respond to any such written request for such a decision within three (3) business days and if no response is provided, or if the Architect/Engineer’s written decision is to the effect that the Work is included in the performance required by the Contract Documents, the Contractor may file with the Principal Representative and the Architect/Engineer a Notice of claim in accordance with Article 36, Claims. Whether or not a Notice of claim is filed, the Contractor shall proceed with the ordered Work. Disagreement with the decision of the Architect/Engineer shall not be grounds for the Contractor to refuse to perform the Work directed or to suspend or terminate performance.

SCHEDULE 2 - ACCESS TO WORK

The Architect/Engineer, the Principal Representative and representatives of State Buildings Program shall at all times have access to the Work. The Contractor shall provide proper facilities for such access and for their observations or inspection of the Work.

SCHEDULE 3 - INSPECTION

The Architect/Engineer has agreed to make, or that structural, mechanical, electrical engineers or other consultants will make, periodic visits to the site to generally observe the progress and quality of the Work to determine in general if the Work is proceeding in accordance with the
Contract Documents. Observation may extend to all or any part of the Work and to the preparation, fabrication or manufacture of materials.

Without in any way meaning to be exclusive or to limit the responsibilities of the Architect/Engineer or the Contractor, the Architect/Engineer has agreed to observe, among other aspects of the Work, the following for compliance with the Contract Documents:

a) Compaction testing reports based upon the findings and recommendations of the Principal Representative’s testing consultant;

b) Bearing surfaces of excavations before concrete is placed based upon the findings and recommendations of the Principal Representative’s soils engineering consultant;

c) Reinforcing steel after installation and before concrete is poured;

d) Structural concrete;

e) Laboratory reports on all concrete testing based upon the findings and recommendations of the Principal Representative’s testing consultant;

f) Structural steel during and after erection and prior to its being covered or enclosed;

g) Steel welding: Principal Representative will furnish steel welding inspection consultant/agency if required or necessary for the project;

h) Mechanical and plumbing Work following its installation and prior to its being covered or enclosed;

i) Electrical Work following its installation and prior to its being covered or enclosed; and

Any special or quality control testing required in the Contract Documents provided by the Principal Representative’s testing consultant.

If the Specifications, the Architect/Engineer’s instructions, laws, ordinances of any public authority require any Work to be specifically tested or approved, the Contractor shall give the Principal Representative, Architect/Engineer and appropriate testing agency (if necessary) timely notice of its readiness for observation by the Architect/Engineer or inspection by another authority, and if the inspection is by another authority, of the date fixed for such inspection, required certificates of inspection being secured by the Contractor. The Contractor shall give all required Notices to the Principal Representative or his or her designee for inspections required for the building inspection program. It shall be the responsibility of the Contractor to determine the Notice required by the State pursuant to Building Inspection Record for the Project, according to State form SBP-B.I.R., or the equivalent form required by the Principal Representative as approved by the State Buildings Program. If any portion of the Work should be covered contrary to the reasonable request of the Architect/Engineer, or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Architect/Engineer, be uncovered for its observation and shall be replaced at the Contractor’s expense.

If any other portion of the Work has been covered which the Architect/Engineer has not specifically requested to observe prior to it’s being covered, it may request to see such work and it shall be uncovered by the Contractor. If such work is found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Amendment or Change Order, be charged to the Principal Representative. If such work is found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it is found that this condition
was caused by the Principal Representative or a separate Contractor as provided in Article 18, in which event, the Principal Representative shall be responsible for the payment of such costs.

PART 10 - ARTICLE 7 CONTRACTOR’S SUPERINTENDENCE AND SUPERVISION

The Contractor shall employ, and keep present (as applicable) on the Project during its progress, a competent project manager as satisfactory to the Principal Representative. The project manager shall not be changed except with the consent of the Principal Representative, unless the project manager proves to be unsatisfactory to the Contractor and ceases to be in his or her employ. The project manager shall represent the Contractor for the Project, and in the absence of the Contractor, all directions given to the project manager shall be as binding as if given to the Contractor. Directions received by the project manager shall be documented by the project manager and communicated in writing with the Contractor.

The Contractor shall employ, and keep present on the Project during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Architect/Engineer and the Principal Representative. The superintendent shall not be changed except with the consent of the Architect/Engineer and the Principal Representative, unless the superintendent proves to be unsatisfactory to the Project Manager/Contractor and ceases to be in his or her employ. The superintendent shall represent the Project Manager/Contractor in his or her absence and all directions given to the superintendent shall be as binding as if given to the Project Manager/Contractor. Directions received by the superintendent shall be documented by the superintendent and confirmed in writing with the Project Manager/Contractor.

The Contractor shall give efficient supervision to the Work, using his or her best skill and attention. He or she shall carefully study and compare all Drawings, Specifications and other written instructions and shall without delay report any error, inconsistency or omission which he or she may discover in writing to the Architect/Engineer. The Contractor shall not be liable to the Principal Representative for damage to the extent it results from errors or deficiencies in the Contract Documents or other instructions by the Architect/Engineer, unless the Contractor knew or had reason to know, that damage would result by proceeding and the Contractor fails to so advise the Architect/Engineer.

The superintendent shall see that the Work is carried out in accordance with the Contract Documents and in a uniform, thorough and first-class manner in every respect. The Contractor’s superintendent shall establish all lines, levels, and marks necessary to facilitate the operations of all concerned in the Contractor’s Work. The Contractor shall lay out all Work in a manner satisfactory to the Architect/Engineer, making permanent records of all lines and levels required for excavation, grading, foundations, and for all other parts of the Work.

PART 11 - ARTICLE 8 MATERIALS AND EMPLOYEES

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation and other facilities necessary for the execution and completion of the Work.
Unless otherwise specified, all materials shall be new and both workmanship and materials shall be first class and of uniform quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor is fully responsible for all acts and omissions of the Contractor’s employees and shall at all times enforce strict discipline and good order among employees on the site. The Contractor shall not employ on the Work any person reasonably deemed unfit by the Principal Representative or anyone not skilled in the Work assigned to him.

PART 12 - ARTICLE 9  SURVEYS, PERMITS, LAWS, TAXES AND REGULATIONS

SCHEDULE 0 - SURVEYS

The Principal Representative shall furnish all surveys, property lines and bench marks deemed necessary by the Architect/Engineer, unless otherwise specified.

SCHEDULE 1 - PERMITS AND LICENSES

Permits and licenses necessary for the prosecution of the Work shall be secured and paid for by the Contractor. Unless otherwise specified in the Specifications, no local municipal or county building permit shall be required. However, State Buildings Program requires each Principal Representative to administer a building code inspection program, the implementation of which may vary at each agency or institution of the State. The Contractors’ employees shall become personally familiar with these local conditions and requirements and shall fully comply with such requirements. State electrical and plumbing permits are required, unless the requirement to obtain such permits is altered by State Building’s Programs. The Contractor shall obtain and pay for such permits.

Easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Principal Representative, unless otherwise specified.

SCHEDULE 2 - TAXES

PRODUCT DATA SHEET 0 - Refund of Sales and Use Taxes

The Contractor shall pay all local taxes required to be paid, including but not necessarily limited to all sales and use taxes. If requested by the Principal Representative prior to issuance of the Notice to Proceed or directed in the Supplementary General Conditions or the Specifications, the Contractor shall maintain records of such payments in respect to the Work, which shall be separate and distinct from all other records maintained by the Contractor, and the Contractor shall furnish such data as may be necessary to enable the State of Colorado, acting by and through the Principal Representative, to obtain any refunds of such taxes which may be available under the laws, ordinances, rules or regulations applicable to such taxes. When so requested or directed, the Contractor shall require Subcontractors at all tiers to pay all local sales and use taxes required to be paid and to maintain records and furnish the Contractor with such data as may be necessary to obtain refunds of the taxes paid by such Subcontractors. No State sales and use taxes are to be paid on material to be used in this Project. On application by the purchaser or seller, the Department of Revenue shall issue to a Contractor or to a Subcontractor at any tier, a certificate or certificates of exemption per C.R.S. § 39-26-703(2)(b), and C.R.S. § 39-26-708.
PRODUCT DATA SHEET 1 - Federal Taxes

The Contractor shall exclude the amount of any applicable federal excise or manufacturers’ taxes from the proposal. The Principal Representative will furnish the Contractor, on request exemption certificates.

SCHEDULE 3 - LAWS AND REGULATIONS

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn or specified. If the Contractor observes that the Drawings or Specifications require Work, which is at variance therewith, the Contractor shall, without delay, notify the Architect/Engineer in writing and any necessary changes shall be adjusted as provided in Article 35, Changes In The Work.

The Contractor shall bear all costs arising from the performance of Work required by the Drawings or Specifications that the Contractor knows to be contrary to such laws, ordinances, rules or regulations, if such Work is performed without giving Notice to the Architect/Engineer.

PART 13 - ARTICLE 10 PROTECTION OF WORK AND PROPERTY

SCHEDULE 0 - GENERAL PROVISIONS

The Contractor shall continuously maintain adequate protection of all Work and materials, protect the property from injury or loss arising in connection with this Contract and adequately protect adjacent property as provided by law and the Contract Documents. The Contractor shall make good any damage, injury or loss, except to the extent:

a) Directly due to errors in the Contract Documents;

b) Caused by agents or employees of the Principal Representative; and,

c) Due to causes beyond the Contractor’s control and not to fault or negligence; provided such damage, injury or loss would not be covered by the insurance required to be carried by the Contractor;

SCHEDULE 1 - SAFETY PRECAUTIONS

The Contractor shall take all necessary precautions for the safety of employees on the Project, and shall comply with all applicable provisions of federal, State and municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the premises where the Work is being performed. He or she shall erect and properly maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for the protection of Workers and the public and shall post danger signs warning against the hazards created by such features of construction as protruding nails, hoists, well holes, elevator hatchways, scaffolding, window openings, stairways and falling materials; and he or she shall designate a responsible member of his or her organization on the Project, whose duty shall be the prevention of accidents. The name and position of any person so designated shall be reported to the Architect/Engineer by the Contractor.

The Contractor shall provide all necessary bracing, shoring and tying of all structures, decks and framing to prevent any structural failure of any material which could result in damage to property
or the injury or death of persons; take all precautions to insure that no part of any structure of
any description is loaded beyond its carrying capacity with anything that will endanger its safety
at any time during the execution of this Contract; and provide for the adequacy and safety of all
scaffolding and hoisting equipment. The Contractor shall not permit open fires within the building
enclosure. The Contractor shall construct and maintain all necessary temporary drainage and do
all pumping necessary to keep excavations and floors, pits and trenches free of water. The
Contractor shall be solely responsible for all construction means, methods, techniques, sequences
and procedures, and for coordinating all portions of the Work, except as otherwise noted.

The Contractor shall take due precautions when obstructing sidewalks, streets or other public
ways in any manner, and shall provide, erect and maintain barricades, temporary walkways,
roadways, trench covers, colored lights or danger signals and any other devices necessary or
required to assure the safe passage of pedestrians and automobiles.

SCHEDULE 2 - EMERGENCIES

In an emergency affecting the safety of life or of the Work or of adjoining property, the Contractor
without special instruction or authorization from the Architect/Engineer or Principal
Representative, is hereby permitted to act, at his or her discretion, to prevent such threatened
loss or injury; and he or she shall so act, without appeal, if so authorized or instructed. Provided
the Contractor has no responsibilities for the emergency, if the Contractor incurs additional cost
not otherwise recoverable from insurance or others on account of any such emergency Work, the
Contract sum shall be equitably adjusted in accordance with Article 35, Changes In The Work.

PART 14 - ARTICLE 11 DRAWINGS AND SPECIFICATIONS ON THE WORK

The Contractor shall keep on the job site one copy of the Contract Documents in good order,
including current copies of all Drawings and Specifications for the Work, and any approved Shop
Drawings, Product Data or Samples, and as-built drawings. As-built drawings shall be updated
weekly by the Contractor and Subcontractors to reflect actual constructed conditions including
dimensioned locations of underground Work and the Contractor's failure to maintain such
updates may be grounds to withhold portions of payments otherwise due in accordance with
Article 33, Payments Withheld. All such documents shall be available to the Architect/Engineer
and representatives of the State. In addition, the Contractor shall keep on the job site one copy
of all approved addenda, Change Orders and requests for information issued for the Work.

The Contractor shall develop procedures to insure the currency and accuracy of as-built drawings
and shall maintain on a current basis a log of requests for information and responses thereto, a
Shop Drawing and Product Data submittal log, and a Sample submittal log to record the status of
all necessary and required submittals.

PART 15 - ARTICLE 12 REQUESTS FOR INFORMATION AND SCHEDULES

SCHEDULE 0 - REQUESTS FOR INFORMATION

The Architect/Engineer shall furnish additional instructions with reasonable promptness, by
means of drawings or otherwise, necessary for the proper execution of the Work. All such
drawings and instructions shall be consistent with the Contract Documents and reasonably inferable there from. The Architect/Engineer shall determine what additional instructions or drawings are necessary for the proper execution of the Work.

The Work shall be executed in conformity with such instructions and the Contractor shall do no Work without proper drawings, specifications or instructions. If the Contractor believes additional instructions, specifications or drawings are needed for the performance of any portion of the Work, the Contractor shall give Notice of such need in writing through a request for information furnished to the Architect/Engineer sufficiently in advance of the need for such additional instructions, specifications or drawings to avoid delay and to allow the Architect/Engineer a reasonable time to respond. The Contractor shall maintain a log of the requests for information and the responses provided.

SCHEDULE 1 - SCHEDULES

PRODUCT DATA SHEET 0 - Submittal Schedules

Prior to filing the Contractor’s first application for payment, a schedule shall be prepared which may be preliminary to the extent required, fixing the dates for the submission and initial review of required Shop Drawings, Product Data and Samples for the beginning of manufacture and installation of materials, and for the completion of the various parts of the Work. It shall be prepared so as to cause no delay in the Work or in the Work of any other contractor. The schedule shall be subject to change from time to time in accordance with the progress of the Work, and it shall be subject to the review and approval by the Architect/Engineer. It shall fix the dates at which the various Shop Drawings Product Data and Samples will be required from the Architect/Engineer. The Architect/Engineer, after review and agreement as to the time provided for initial review, shall review and comment on the Shop Drawings, Product Data and Samples in accordance with that schedule. The schedule shall be finalized, prepared and submitted with respect to each of the elements of the Work in time to avoid delay, considering reasonable periods for review, manufacture or installation.

At the time the schedule is prepared, the Contractor, the Architect/Engineer and Principal Representative shall jointly identify the Shop Drawing, Product Data and Samples, if any, which the Principal Representative shall receive simultaneously with the Architect/Engineer for the purposes of owner coordination with existing facility standards and systems. The Contractor shall furnish a copy for the Principal Representative when so requested. Transmittal of Shop Drawings and Product Data copies to the Principal Representative shall be solely for the convenience of the Principal Representative and shall neither create nor imply responsibility or duty of review by the Principal Representative.

The Contractor may also, or at the direction of the Principal Representative at any time shall, prepare and maintain a schedule, which may also be preliminary and subject to change to the extent required, fixing the dates for the initial responses to requests for information or for detail drawings which will be required from the Architect/Engineer to allow the beginning of manufacture, installation of materials and for the completion of the various parts of the Work. The schedule shall be subject to review and approval by the Architect/Engineer. The Architect/Engineer shall, after review and agreement, furnish responses and detail drawings in accordance with that schedule. Any such schedule shall be prepared and approved in time to avoid delay, considering reasonable periods for review, manufacture or installation, but so long as the request for information schedule is being maintained, it shall not be deemed to transfer
responsibility to the Contractor for errors or omissions in the Contract Documents where circumstances make timely review and performance impossible.

The Architect/Engineer shall not unreasonably withhold approval of the Contractor’s schedules and shall inform the Contractor and the Principal Representative of the basis of any refusal to agree to the Contractor’s schedules. The Principal Representative shall attempt to resolve any disagreements.

PRODUCT DATA SHEET 1 - Schedule of Values

Within twenty-one (21) calendar days after the date of the Notice to Proceed, the Contractor shall submit to the Architect/Engineer and Principal Representative, for approval, and to the State Buildings Program when specifically requested, a complete itemized schedule of the values of the various parts of the Work, as estimated by the Contractor, aggregating the total price. The schedule of values shall be in such detail as the Architect/Engineer or the Principal Representative shall require, prepared on forms acceptable to the Principal Representative. It shall, at a minimum, identify on a separate line each division of the Specifications including the general conditions costs to be charged to the Project. The Contractor shall revise and resubmit the schedule of values for approval when, in the opinion of the Architect/Engineer or the Principal Representative, such resubmittal is required due to changes or modifications to the Contract Documents or the Contract sum.

The total cost of each line item so separately identified shall, when requested by the Architect/Engineer or the Principal Representative, be broken down into reasonable estimates of the value of:

d) Material, which shall include the cost of material actually built into the Project plus any local sales or use tax paid thereon; and,

e) Labor and other costs.

The cost of subcontracts shall be incorporated in the Contractor’s schedule of values, and when requested by the Architect/Engineer or the Principal Representative, shall be separately shown as line items.

The Architect/Engineer shall review the proposed schedules and approve it after consultation with the Principal Representative, or advise the Contractor of any required revisions within ten (10) days of its receipt. In the event no action is taken on the submittal within ten days, the Contractor may utilize the schedule of values as its submittal for payment until it is approved or until revisions are requested.

When the Architect/Engineer deems it appropriate to facilitate certification of the amounts due to the Contractor, further breakdown of subcontracts, including breakdown by labor and materials, may be directed.

This schedule of values, when approved, will be used in preparing Contractor’s applications for payment on State Form SC-7.2, Application for Payment.

PRODUCT DATA SHEET 2 - Construction Schedules

Within twenty-one (21) calendar days after the date of the Notice to Proceed, the Contractor shall submit to the Architect/Engineer and the Principal Representative, and to the State Buildings
Program when specifically requested, on a form acceptable to them, an overall timetable of the construction schedule for the Project. Unless the Supplementary General Conditions or the Specifications allow scheduling with bar charts or other less sophisticated scheduling tools, the Contractor’s schedule shall be a critical-path method (CPM) construction schedule. The CPM schedule shall start with the date of the Notice to Proceed and include submittals activities, the various construction activities, change order Work (when applicable), close-out, testing, demonstration of equipment operation when called for in the Specifications, and acceptance. The CPM schedule shall at a minimum correlate to the schedule of values line items and shall be cost loaded if requested by the Architect/Engineer or Principal Representative. The completion time shall be the time specified in the Agreement and all Project scheduling shall allocate float utilizing the full period available for construction as specified in the Agreement on State Form SC 6.13, without indication of early completion, unless such earlier completion is approved in writing by the Principal Representative and State Building Programs.

The time shown between the starting and completion dates of the various elements within the construction schedule shall represent one hundred per cent (100%) completion of each element.

All other elements of the CPM schedule shall be as required by the Specifications. In addition, the Contractor shall submit monthly updates or more frequently, if required by the Principal Representative, updates of the construction schedule. These updates shall reflect the Contractor’s “Work in place” progress.

When requested by the Architect/Engineer, the Principal Representative or the State Buildings Program, the Contractor shall revise the construction schedule to reflect changes in the schedule of values.

When the testing of materials is required by the Specifications, the Contractor shall also prepare and submit to the Architect/Engineer and the Principal Representative a schedule for testing in accordance with Article 14, Samples and Testing.

**PART 16 - ARTICLE 13 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

**SCHEDULE 0 - SUBMITTAL PROCESS**

The Contractor shall check and field verify all dimensions. The Contractor shall check, approve and submit to the Architect/Engineer in accordance with the schedule described in Article 12, Requests for Information and Schedules, all Shop Drawings, Product Data and Samples required by the specifications or required by the Contractor for the Work of the various trades. All Drawings and Product Data shall contain identifying nomenclature and each submittal shall be accompanied by a letter of transmittal identifying in detail all enclosures. The number of copies of Shop Drawings and Product Data to be submitted shall be as specified in the Specifications and if no number is specified then three copies shall be submitted.

The Architect/Engineer shall review and comment on the Shop Drawings and Product Data within the time provided in the agreed upon schedule for conformance with information given and the design concept expressed in, or reasonably inferred from, the Contract Documents. The nature of all corrections to be made to the Shop Drawings and Product Data, if any, shall be clearly noted, and the submittals shall be returned to the Contractor for such corrections. If a change in the
scope of the Work is intended by revisions requested to any Shop Drawings and Product Data, the Contractor shall be requested to prepare a change proposal in accordance with Article 35, Changes In The Work. On resubmitted Shop Drawings, Product Data or Samples, the Contractor shall direct specific attention in writing on the transmittal cover to revisions other than those corrections requested by the Architect/Engineer on any previously checked submittal. The Architect/Engineer shall promptly review and comment on, and return, the resubmitted items.

The Contractor shall thereafter furnish such other copies in the form approved by the Architect/Engineer as may be needed for the prosecution of the Work.

SCHEDULE 1 - FABRICATION AND ORDERING

Fabrication shall be started by the Contractor only after receiving approved Shop Drawings from the Architect/Engineer. Materials shall be ordered in accordance with approved Product Data. Work which is improperly fabricated, whether through incorrect Shop Drawings, faulty workmanship or materials, will not be acceptable.

SCHEDULE 2 - DEVIATIONS FROM DRAWINGS OR SPECIFICATIONS

The review and comments of the Architect/Engineer of Shop Drawings, Product Data or Samples shall not relieve the Contractor from responsibility for deviations from the Drawings or Specifications, unless he or she has in writing called the attention of the Architect/Engineer to such deviations at the time of submission, nor shall it relieve the Contractor from responsibility for errors of any sort in Shop Drawings or Product Data. Review and comments on Shop Drawings or Product Data containing identified deviations from the Contract Documents shall not be the basis for a Change Order or a claim based on a change in the scope of the Work unless Notice is given to the Architect/Engineer and Principal Representative of all additional costs, time and other impacts of the identified deviation by bring it to their attention in writing at the time the submittals are made, and any subsequent change in the Contract sum or the Contract time shall be limited to cost, time and impacts so identified.

SCHEDULE 3 - CONTRACTOR REPRESENTATIONS

By preparing, approving, and/or submitting Shop Drawings, Product Data and Samples, the Contractor represents that the Contractor has determined and verified all materials, field measurements, and field construction criteria related thereto, and has checked and coordinated the information contained within each submittal with the requirements of the Work, the Project and the Contract Documents and prior reviews and approvals.

PART 17 - ARTICLE 14  SAMPLES AND TESTING

SCHEDULE 0 - SAMPLES

The Contractor shall furnish for approval, with such promptness as to cause no delay in his or her Work or in that of any other Contractor, all Samples as directed by the Architect/Engineer. The Architect/Engineer shall check and approve such Samples, with reasonable promptness, but only for conformance with the design intent of the Contract Documents and the Project, and for compliance with any submission requirements given in the Contract Documents.
SCHEDULE 1 - TESTING - GENERAL

The Contractor shall provide such equipment and facilities as the Architect/Engineer may require for conducting field tests and for collecting and forwarding samples to be tested. Samples themselves shall not be incorporated into the Work after approval without the permission of the Architect/Engineer.

All materials or equipment proposed to be used may be tested at any time during their preparation or use. The Contractor shall furnish the required samples without charge and shall give sufficient Notice of the placing of orders to permit the testing thereof. Products may be sampled either prior to shipment or after being received at the site of the Work.

Tests shall be made by an accredited testing laboratory. Except as otherwise provided in the Specifications, sampling and testing of all materials, and the laboratory methods and testing equipment, shall be in accordance with the latest standards and tentative methods of the American Society of Testing Materials (ASTM). The cost of testing which is in addition to the requirements of the Specifications shall be paid by the Contractor if so directed by the Architect/Engineer, and the Contract sum shall be adjusted accordingly by Change Order; provided however, that whenever testing shows portions of the Work to be deficient, all costs of testing including that required to verify the adequacy of repair or replacement Work shall be the responsibility of the Contractor.

SCHEDULE 2 - TESTING - CONCRETE AND SOILS

Unless otherwise specified or provided elsewhere in the Contract Documents, the Principal Representative will contract for and pay for the testing of concrete and for soils compaction testing through an independent laboratory or laboratories selected and approved by the Principal Representative. The Contractor shall assume the responsibility of arranging, scheduling and coordinating the concrete sample collection efforts and soils compaction efforts in an efficient and cost effective manner. Testing shall be performed in accordance with the requirements of the Specifications, and if no requirements are specified, the Contractor shall request instructions and testing shall be as directed by the Architect/Engineer or the soils engineer, as applicable, and in accordance with standard industry practices.

The Principal Representative and the Architect/Engineer shall be given reasonable advance notice of each concrete pour and reserve the right to either increase or decrease the number of cylinders or the frequency of tests.

Soil compaction testing shall be at random locations selected by the soils engineer. In general, soils compaction testing shall be as directed by the soils engineer and shall include all substrate prior to backfill or construction.

SCHEDULE 3 - TESTING - OTHER

Additional testing required by the Specifications will be accomplished and paid for by the Principal Representative in a manner similar to that for concrete and soils unless noted otherwise in the Specifications. In any case, the Contractor will be responsible for arranging, scheduling and coordinating additional tests. Where the additional testing will be contracted and paid for by the Principal Representative the Contractor shall give the Principal Representative not less than one-month advance written Notice of the date the first such test will be required.
PART 18 - ARTICLE 15  SUBCONTRACTS

SCHEDULE 0 - CONTRACT PERFORMANCE OUTSIDE OF THE UNITED STATES OR COLORADO

After the contract is awarded, Contractor is required to provide written notice to the Principal Representative no later than twenty (20) days after deciding to perform services under this contract outside the United States or Colorado or to subcontract services under this contract to a subcontractor that will perform such services outside the United States or Colorado. The written notification must include, but need not be limited to, a statement of the type of services that will be performed at a location outside the United States or Colorado and the reason why it is necessary or advantageous to go outside the United States or Colorado to perform the services. All notices received by the State pursuant to outsourced services shall be posted on the Colorado Department of Personnel & Administration’s website. If Contractor knowingly fails to notify the Principal Representative of any outsourced services as specified herein, the Principal Representative, at its discretion, may terminate this contract as provided in the Colorado Procurement Code or the applicable procurement code for institutions of higher education (Does not apply to any project that receives federal moneys)

SCHEDULE 1 - SUBCONTRACTOR LIST

Prior to the Notice to Proceed to commence construction, the Contractor shall submit to the Architect/Engineer, the Principal Representative and State Buildings Program a preliminary list of Subcontractors. It shall be as complete as possible at the time, showing all known Subcontractors planned for the Work. The list shall be supplemented as other Subcontractors are determined by the Contractor and any such supplemental list shall be submitted to the Architect/Engineer, the Principal Representative and State Buildings Program not less than ten (10) days before the Subcontractor commences Work.

SCHEDULE 2 - SUBCONTRACTOR SUBSTITUTIONS

The Contractor’s list shall include those Subcontractors, if any, which the Contractor indicated in its bid, would be employed for specific portions of the Work if such indication was requested in the bid documents issued by the State. The substitution of any Subcontractor listed in the Contractor's bid shall be justified in writing not less than ten (10) days after the date of the Notice to Proceed to commence construction, and shall be subject to the approval of the Principal Representative. For reasons such as the Subcontractor’s refusal to perform as agreed, subsequent unavailability or later discovered bid errors, or other similar reasons, but not including the availability of a lower Subcontract price, such substitution may be approved. The Contractor shall bear any additional cost incurred by such substitutions.

SCHEDULE 3 - CONTRACTOR RESPONSIBLE FOR SUBCONTRACTORS

The Contractor shall not employ any Subcontractor that the Architect/Engineer, within ten (10) days after the date of receipt of the Contractor’s list of Subcontractors or any supplemental list, objects to in writing as being unacceptable to either the Architect/Engineer, the Principal Representative or State Buildings Program. If a Subcontractor is deemed unacceptable, the Contractor shall propose a substitute Subcontractor and the Contract sum shall be adjusted by any demonstrated difference between the Subcontractor’s bids, except where the Subcontractor
has been debarred by the State or fails to meet qualifications of the Contract Documents to perform the Work proposed.

The Contractor shall be fully responsible to the Principal Representative for the acts and omissions of Subcontractors and of persons either directly or indirectly employed by them. All instructions or orders in respect to Work to be done by Subcontractors shall be given to the Contractor.

**PART 19 - ARTICLE 16  RELATIONS OF CONTRACTOR AND SUBCONTRACTOR**

The Contractor agrees to bind each Subcontractor to the terms of these General Conditions and to the requirements of the Drawings and Specifications, and any Addenda thereto, and also all the other Contract Documents, so far as applicable to the Work of such Subcontractor. The Contractor further agrees to bind each Subcontractor to those terms of the General Conditions which expressly require that Subcontractors also be bound, including without limitation, requirements that Subcontractors waive all rights of subrogation, provide adequate general commercial liability and property insurance, automobile insurance and workers’ compensation insurance as provided in Article 25, Insurance.

Nothing contained in the Contract Documents shall be deemed to create any contractual relationship whatsoever between any Subcontractor and the State of Colorado acting by and through its Principal Representative.

**PART 20 - ARTICLE 17  MUTUAL RESPONSIBILITY OF CONTRACTORS**

Should the Contractor cause damage to any separate contractor on the Work, the Contractor agrees, upon due Notice, to settle with such contractor by agreement, if he or she will so settle. If such separate contractor sues the Principal Representative on account of any damage alleged to have been so sustained, the Principal Representative shall notify the Contractor, who shall defend such proceedings if requested to do so by Principal Representative. If any judgment against the Principal Representative arises there from, the Contractor shall pay or satisfy it and pay all costs and reasonable attorney fees incurred by the Principal Representative, in accordance with Article 53.8, Indemnification, provided the Contractor was given due Notice of an opportunity to settle.

**PART 21 - ARTICLE 18  SEPARATE CONTRACTS**

The Principal Representative reserves the right to enter into other contracts in connection with the Project or the Contract. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their Work, and shall properly connect and coordinate his or her Work with theirs. If any part of the Contractor’s Work depends, for proper execution or results, upon the Work of any other contractor, the Contractor shall inspect and promptly report to the Architect/Engineer any defects in such Work that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report shall constitute an acceptance of the other contractor's Work as fit and proper for the
reception of Work, except as to defects which may develop in the other Contractor’s Work after the execution of the Contractor’s Work.

To insure the proper execution of subsequent Work, the Contractor shall measure Work already in place and shall at once report to the Architect/Engineer any discrepancy between the executed Work and the Drawings.

PART 22 - ARTICLE 19  USE OF PREMISES

The Contractor shall confine apparatus, the storage of materials and the operations of workmen to limits indicated by law, ordinances, permits and any limits lines shown on the Drawings. The Contractor shall not unreasonably encumber the premises with materials.

The Contractor shall enforce all of the Architect/Engineer’s instructions and prohibitions regarding, without limitation, such matters as signs, advertisements, fires and smoking.

PART 23 - ARTICLE 20  CUTTING, FITTING OR PATCHING

The Contractor shall do all cutting, fitting or patching of Work that may be required to make its several parts come together properly and fit it to receive or be received by Work of other Contractors shown upon, or reasonably inferred from, the Drawings and Specifications for the complete structure, and shall provide for such finishes to patched or fitted Work as the Architect/Engineer may direct. The Contractor shall not endanger any Work by cutting, excavating or otherwise altering the Work and shall not cut or alter the Work of any other Contractor save with the consent of the Architect/Engineer.

PART 24 - ARTICLE 21  UTILITIES

SCHEDULE 0 - TEMPORARY UTILITIES

Unless otherwise specifically stated in the Specifications or on the Drawings, the Principal Representative shall be responsible for the locations of all utilities as shown on the Drawings or indicated elsewhere in the Specifications, subject to the Contractor’s compliance with all statutory or regulatory requirements to call for utility locates. When actual conditions deviate from those shown the Contractor shall comply with the requirements of Article 37, Differing Site Conditions. The Contractor shall provide and pay for the installation of all temporary utilities required to supply all the power, light and water needed by him or her and other Contractors for their Work and shall install and maintain all such utilities in such manner as to protect the public and Workmen and conform with any applicable laws and regulations. Upon completion of the Work, he or she shall remove all such temporary utilities from the site. The Contractor shall pay for all consumption of power, light and water used by him or her and the other Contractors, without regard to whether such items are metered by temporary or permanent meters. The Superintendent shall have full authority over all trades and Subcontractors at any tier to prevent waste. The cut-off date on permanent meters shall be either the agreed date of the date of the Notice of Substantial Completion or the Notice of Approval of Occupancy/Use of the Project.
SCHEDULE 1 - PROTECTION OF EXISTING UTILITIES

Where existing utilities, such as water mains, sanitary sewers, storm sewers and electrical conduits, are shown on the Drawings, the Contractor shall be responsible for the protection thereof, without regard to whether any such utilities are to be relocated or removed as a part of the Work. If any utilities are to be moved, the moving must be conducted in such manner as not to cause undue interruption or delay in the operation of the same.

SCHEDULE 2 - CROSSING OF UTILITIES

When new construction crosses highways, railroads, streets, or utilities under the jurisdiction of State, city or other public agency, public utility or private entity, the Contractor shall secure proper written permission before executing such new construction. The Contractor will be required to furnish a proper release before final acceptance of the Work.

PART 25 - ARTICLE 22  UNSUITABLE CONDITIONS

The Contractor shall not Work at any time, or permit any Work to be done, under any conditions contrary to those recommended by manufacturers or industry standards which are otherwise proper, unsuited for proper execution, safety and performance. Any cost caused by ill-timed Work shall be borne by the Contractor unless the timing of such Work shall have been directed by the Architect/Engineer or the Principal Representative, after the award of the Contract, and the Contractor provided Notice of any additional cost.

PART 26 - ARTICLE 23  TEMPORARY FACILITIES

SCHEDULE 0 - OFFICE FACILITIES

The Contractor shall provide and maintain without additional expense for the duration of the Project temporary office facilities, as required and as specified, for its own use and the use of the Architect/Engineer, representatives of the Principal Representative and State Buildings Program.

SCHEDULE 1 - TEMPORARY HEAT

The Contractor shall furnish and pay for all the labor, facilities, equipment, fuel and power necessary to supply temporary heating, ventilating and air conditioning, except to the extent otherwise specified, and shall be responsible for the installation, operation, maintenance and removal of such facilities and equipment. Unless otherwise specified, the permanent HVAC system shall not be used for temporary heat in whole or in part. If the Contractor desires to put the permanent system into use, in whole or in part, the Contractor shall set it into operation and furnish the necessary fuel and manpower to safely operate, protect and maintain that HVAC system. Any operation of all or any part of the permanent HVAC system including operation for testing purposes shall not constitute acceptance of the system, nor shall it relieve the Contractor of his or her one-year guarantee of the system from the date of the Notice of Substantial Completion of the entire Project, and if necessary due to prior operation, the Contractor shall provide manufacturers’ extended warranties from the date of the Contractor’s use prior to the date of the Notice of Substantial Completion.
SCHEDULE 2 - WEATHER PROTECTION

The Contractor shall, at all times, provide protection against weather, so as to maintain all Work, materials, apparatus and fixtures free from injury or damages.

SCHEDULE 3 - DUST PARTITIONS

If the Work involves Work in an occupied existing building, the Contractor shall erect and maintain during the progress of the Work, suitable dust-proof temporary partitions, or more permanent partitions as specified, to protect such building and the occupants thereof.

SCHEDULE 4 - BENCH MARKS

The Contractor shall maintain any site bench marks provided by the Principal Representative and shall establish any additional benchmarks specified by the Architect/Engineer as necessary for the Contractor to layout the Work and ascertain all grades and levels as needed.

SCHEDULE 5 - SIGN

The Contractor shall erect and permit one 4’ x 8’ sign only at the site to identify the Project as specified or directed by the Architect/Engineer which shall be maintained in good condition during the life of the Project.

SCHEDULE 6 - SANITARY PROVISION

The Contractor shall provide and maintain suitable, clean, temporary sanitary toilet facilities for any and all workmen engaged on the Work, for the entire construction period, in strict compliance with the requirement of all applicable codes, regulations, laws and ordinances, and no other facilities, new or existing, may be used by any person on the Project. When the Project is complete the Contractor shall promptly remove them from the site, disinfect, and clean or treat the areas as required. If any new construction surfaces in the Project other than the toilet facilities provided for herein are soiled at any time, the entire areas so soiled shall be completely removed from the Project and rebuilt. In no event may present toilet facilities of any existing building at the site of the Work be used by employees of any contractor.

PART 27 - ARTICLE 24  CLEANING UP

The Contractor shall keep the building and premises free from all surplus material, waste material, dirt and rubbish caused by employees or Work, and at the completion of the Work shall remove all such surplus material, waste material, dirt, and rubbish, as well as all tools, equipment and scaffolding, and shall wash and clean all window glass and plumbing fixtures, perform cleanup and cleaning required by the Specifications and leave all of the Work clean unless more exact requirements are specified.
PART 28 - ARTICLE 25  INSURANCE

SCHEDULE 0 - GENERAL

The Contractor shall procure and maintain all insurance requirements and limits as set forth below, at his or her own expense, for the length of time set forth in Contract requirements. The Contractor shall continue to provide evidence of such coverage to State of Colorado on an annual basis during the aforementioned period including all of the terms of the insurance and indemnification requirements of this agreement. All below insurance policies shall include a provision preventing cancellation without thirty (30) days’ prior notice by certified mail. A completed Certificate of insurance shall be filed with the Principal Representative and State Buildings Program within ten (10) days after the date of the Notice of Award, said Certificate to specifically state the inclusion of the coverages and provisions set forth herein and shall state whether the coverage is “claims made” or “per occurrence”.

SCHEDULE 1 - COMMERCIAL GENERAL LIABILITY INSURANCE (CGL)

This insurance must protect the Contractor from all claims for bodily injury, including death and all claims for destruction of or damage to property (other than the Work itself), arising out of or in connection with any operations under this Contract, whether such operations be by the Contractor or by any Subcontractor under him or anyone directly or indirectly employed by the Contractor or by a Subcontractor. All such insurance shall be written with limits and coverages as specified below and shall be written on an occurrence form.

General Aggregate $2,000,000
Products – Completed Operations Aggregate $2,000,000
Each Occurrence $1,000,000
Personal Injury $1,000,000

The following coverages shall be included in the CGL:

a) Per project general aggregate (CG 25 03 or similar)

b) Additional Insured status in favor of the State of Colorado and any other parties as outlined in The Contract and must include both ONGOING Operations AND COMPLETED Operations per CG2010 10/01 and CG 2037 10/01 or equivalent as permitted by law.

c) The policy shall be endorsed to be primary and non-contributory with any insurance maintained by Additional Insureds.

d) A waiver of Subrogation in favor of all Additional Insured parties.

e) Personal Injury Liability

f) Contractual Liability coverage to support indemnification obligation per Article 53.8

g) Explosion, collapse and underground (xcu)

The following exclusionary endorsements are prohibited in the CGL policy:

a) Damage to Work performed by Subcontract/Vendor (CG 22-94 or similar)

b) Contractual Liability Coverage Exclusion modifying or deleting the definition of an “insured contract” from the unaltered SO CG 0001 1001 policy from (CG 24 26 or similar)
If applicable to the Work to be performed: Residential or multi-family

c) If applicable to the Work to be performed: Exterior insulation finish systems
d) If applicable to the Work to be performed: Subsidence or Earth Movement

The Contractor shall maintain general liability coverage including Products and Completed Operations insurance, and the Additional Insured with primary and non-contributory coverage as specified in this Contract for three (3) years after completion of the project.

**SCHEDULE 2 - AUTOMOBILE LIABILITY INSURANCE**

Automobile and business auto liability covering liability arising out of any auto (including owned, hired and non-owned autos).

- Combined Bodily Injury and Property Damage Liability
  - (Combined Single Limit): $1,000,000 each accident

  Coverages:
  - Specific waiver of subrogation

**SCHEDULE 3 - WORKERS' COMPENSATION INSURANCE**

The Contractor shall procure and maintain Workers' Compensation Insurance at his or her own expense during the life of this Contract, including occupational disease provisions for all employees per statutory requirements. Policy shall contain a waiver of subrogation in favor of the State of Colorado.

The Contractor shall also require each Subcontractor to furnish Workers' Compensation Insurance, including occupational disease provisions for all of the latter’s employees, and to the extent not furnished, the Contractor accepts full liability and responsibility for Subcontractor’s employees.

In cases where any class of employees engaged in hazardous Work under this Contract at the site of the Project is not protected under the Workers’ Compensation statute, the Contractor shall provide, and shall cause each Subcontractor to provide, adequate and suitable insurance for the protection of employees not otherwise protected.

**SCHEDULE 4 - UMBRELLA LIABILITY INSURANCE**

(For construction projects exceeding $10,000,000, provide the following coverage)

The Contractor shall maintain umbrella/excess liability insurance on an occurrence basis in excess of the underlying insurance described in Section B-D above. Coverage shall follow the terms of the underlying insurance, included the additional insured and waiver of subrogation provisions. The amounts of insurance required in Sections above may be satisfied by the Contractor purchasing coverage for the limits specified or by any combination of underlying and umbrella limits, so long as the total amount of insurance is not less than the limits specified in each section previously mentioned.

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SCHEDULE 5 - BUILDER’S RISK INSURANCE

Unless otherwise expressly stated in the Supplementary General Conditions (e.g. where the State elects to provide for projects with a completed value of less than $1,000,000), the Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder’s risk “all-risk” or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than the Owner has an insurable interest in the property, or the Date of Notice specified on the Notice of Acceptance, State Form SBP-6.27 or whichever is later.

This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project as named insureds.

All associated deductibles shall be the responsibility of the Contractor. Such policy may have a deductible clause but not to exceed ten thousand dollars ($10,000.00).

Property insurance shall be on an “all risk” or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, false Work, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect’s and Contractor’s services and expenses required as a result of such insured loss.

Contractor shall maintain Builders Risk coverage including partial use by Owner.

The Contractor shall waive all rights of subrogation as regards the State of Colorado and the Principal Representative, its officials, its officers, its agents and its employees, all while acting within the scope and course of their employment for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section or other property insurance applicable to the Work. The Contractor shall require all Subcontractors at any tier to similarly waive all such rights of subrogation and shall expressly include such a waiver in all subcontracts.

Upon request, the amount of such insurance shall be increased to include the cost of any additional Work to be done on the Project, or materials or equipment to be incorporated in the Project, under other independent contracts let or to be let. In such event, the Contractor shall be reimbursed for this cost as his or her share of the insurance in the same ratio as the ratio of the insurance represented by such independent contracts let or to be let to the total insurance carried.

The Principal Representative, with approval of the State Controller, shall have the power to adjust and settle any loss. Unless it is agreed otherwise, all monies received shall be applied first on rebuilding or repairing the destroyed or injured Work.
SCHEDULE 6 - POLLUTION LIABILITY INSURANCE

If Contractor is providing directly or indirectly Work with pollution/environmental hazards, the Contractor must provide or cause those conducting the Work to provide Pollution Liability Insurance coverage. Pollution Liability policy must include contractual liability coverage. State of Colorado must be included as additional insureds on the policy. The policy limits shall be in the amount of $1,000,000 with maximum deductible of $25,000 to be paid by the Subcontractor/Vendor.

SCHEDULE 7 - ADDITIONAL MISCELLANEOUS INSURANCE PROVISIONS

Certificates of Insurance and/or insurance policies required under this Contract shall be subject to the following stipulations and additional requirements:

a) Any and all deductibles or self-insured retentions contained in any Insurance policy shall be assumed by and at the sole risk of the Contractor;

b) If any of the said policies shall fail at any time to meet the requirements of the Contract Documents as to form or substance, or if a company issuing any such policy shall be or at any time cease to be approved by the Division of Insurance of the State of Colorado, or be or cease to be in compliance with any stricter requirements of the Contract Documents, the Contractor shall promptly obtain a new policy, submit the same to the Principal Representative and State Building Programs for approval if requested, and submit a Certificate of Insurance as hereinebefore provided. Upon failure of the Contractor to furnish, deliver and maintain such insurance as provided herein, this Contract, in the sole discretion of the State of Colorado, may be immediately declared suspended, discontinued, or terminated. Failure of the Contractor in obtaining and/or maintaining any required insurance shall not relieve the Contractor from any liability under the Contract, nor shall the insurance requirements be construed to conflict with the obligations of the Contractor concerning indemnification;

c) All requisite insurance shall be obtained from financially responsible insurance companies, authorized to do business in the State of Colorado and acceptable to the Principal Representative;

d) Receipt, review or acceptance by the Principal Representative of any insurance policies or certificates of insurance required by this Contract shall not be construed as a waiver or relieve the Contractor from its obligation to meet the insurance requirements contained in these General Conditions.

PART 29 - ARTICLE 26 CONTRACTOR’S PERFORMANCE AND PAYMENT BONDS

The Contractor shall furnish a Performance Bond and a Labor and Material Payment Bond on State Forms SC-6.22, Performance Bond, and SC-6.221, Labor and Material Payment Bond, or such other forms as State Buildings Program may approve for the Project, executed by a corporate Surety authorized to do business in the State of Colorado and in the full amount of the Contract sum. The expense of these bonds shall be borne by the Contractor and the bonds shall be filed with State Buildings Program.

If, at any time, a Surety on such a bond is found to be, or ceases to be in strict compliance with any qualification requirements of the Contract Documents or the bid documents, or loses its right
to do business in the State of Colorado, another Surety will be required, which the Contractor shall furnish to State Buildings Program within ten (10) days after receipt of Notice from the State or after the Contractor otherwise becomes aware of such conditions.

PART 30 - ARTICLE 27 LABOR AND WAGES

SCHEDULE 0 - COLORADO LABOR

In accordance with laws of Colorado, C.R.S. § 8-17-101(1), as amended, Colorado labor shall be employed to perform at least eighty percent of the Work.

SCHEDULE 1 - PREVAILING WAGE RATES

In accordance with laws of Colorado, C.R.S. § 24-92 Part 2, if prevailing wage rates are applicable to this project:

a) The contractor shall in conspicuous places on the project post an owner provided poster with the current prevailing rate of payments as provided in the project solicitation.

1. A contractor who fails to comply shall be deemed guilty of a class 3 misdemeanor and shall pay the State one hundred dollars ($100) for each calendar day of noncompliance as determined by the State.

The contractor and any subcontractors shall pay all the employees employed directly on the site of the work, unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment computed at wage rates not less than those stated in the competitive solicitation, regardless of any contractual relationships that may be alleged to exist between the contractor or subcontractor and the employees.

The contractor and any subcontractors shall prepare and submit electronic payroll reports to the State in a format approved by OSA on a weekly basis that disclose all relevant payroll information, including the name and address of any entities to which fringe benefits are paid.

The contractor and any subcontractors shall maintain on the site where public projects are being constructed a daily log of employees employed each day on the public project. The log shall include, at a minimum, for each employee his or her name, primary job title, and employer, and shall be kept on a form prescribed by the director. The log shall be available for inspection on the site at all times by the State.

If the contractor or any subcontractor fails to pay wages as are required by the contract, the State shall not approve a warrant or demand for payment to the contractor until the contractor furnishes the State evidence satisfactory to such agency of government that such wages have been paid; except that the State shall approve and pay any portion of a warrant or demand for payment to the contractor to the extent the State has been furnished satisfactory evidence that the contractor or one or more subcontractors has paid such wages required by the contract. The contractor or subcontractor may use the following procedure in order to satisfy the requirements of this section:

2. The contractor or subcontractor may submit to the State, for each employee to whom such wages are due, a check payable to that employee or to the State so it is negotiable.
by either party. Each such check shall be in an amount representing the difference between the accrued wages required to be paid to that employee by the contract and the wages actually paid by the contractor or subcontractor.

3. If any check submitted cannot be delivered to the employee within a reasonable period, then it shall be negotiated by the State and the proceeds deposited in the unclaimed property trust fund created in section 38-13-116.6. Nothing in this subsection (1) shall be construed to lessen the responsibility of the contractor or subcontractor to attempt to locate and pay any employee to whom wages are due.

PART 31 - ARTICLE 28  ROYALTIES AND PATENTS

The Contractor shall be responsible for assuring that all rights to use of products and systems have been properly arranged and shall take such action as may be necessary to avoid delay, at no additional charge to the Principal Representative, where such right is challenged during the course of the Work. The Contractor shall pay all royalties and license fees required to be paid and shall defend all suits or claims for infringement of any patent rights and shall save the State of Colorado harmless from loss on account thereof, in accordance with Article 53.8, Indemnification; provided, however, the Contractor shall not be responsible for such loss or defense for any copyright violations contained in the Contract Documents prepared by the Architect/Engineer or the Principal Representative of which the Contractor is unaware, or for any patent violations based on specified processes that the Contractor is unaware are patented or that the Contractor should not have had reason to believe were patented.

PART 32 - ARTICLE 29  ASSIGNMENT

Except as otherwise provided hereafter the Contractor shall not assign the whole or any part of this Contract without the written consent of the Principal Representative. This provision shall not be construed to prohibit assignments of the right to payment to the extent permitted by C.R.S. § 4-9-406, et. seq., as amended, provided that written Notice of Assignment adequate to identify the rights assigned is received by the Principal Representative and the controller for the agency, department, or institution executing this Contract (as distinguished from the State Controller). Such assignment of the right to payment shall not be deemed valid until receipt by the Principal Representative and such controller and the Contractor assumes the risk that such written Notice of assignment is received by the Principal Representative and the controller for the agency, department, or institution involved. In case the Contractor assigns all or part of any moneys due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any moneys due or to become due to the Contractor shall be subject to all claims of all persons, firms, and corporations for services rendered or materials supplied for the performance of the Work called for in this Contract, whether said services or materials were supplied prior to or after the assignment. Nothing in this Article shall be deemed a waiver of any other defenses available to the State against the Contractor or the assignee.
PART 33 - ARTICLE 30  CORRECTION OF WORK BEFORE ACCEPTANCE

The Contractor shall promptly remove from the premises all Work or materials condemned or declared irreparably defective as failing to conform to the Contract Documents on receipt of written Notice from the Architect/Engineer or the Principal Representative, whether incorporated in the Work or not. If such materials shall have been incorporated in the Work, or if any unsatisfactory Work is discovered, the Contractor shall promptly replace and re-execute his or her Work in accordance with the requirements of the Contract Documents without expense to the Principal Representative, and shall also bear the expense of making good all Work of other contractors destroyed or damaged by the removal or replacement of such defective material or Work.

Should any defective Work or material be discovered during the process of construction, or should reasonable doubt arise as to whether certain material or Work is in accordance with the Contract Documents, the value of such defective or questionable material or Work shall not be included in any application for payment, or if previously included, shall be deducted by the Architect/Engineer from the next application submitted by the Contractor.

If the Contractor does not perform repair, correction and replacement of defective Work, in lieu of proceeding by issuance of a Notice of intent to remove condemned Work as outlined above, the Principal Representative may, not less than seven (7) days after giving the original written Notice of the need to repair, correct, or replace defective Work, deduct all costs and expenses of replacement or correction as instructed by the Architect/Engineer from the Contractor’s next application for payment in addition to the value of the defective Work or material. The Principal Representative may also make an equitable deduction from the Contract sum by unilateral Change Order, in accordance with Article 33, Payments Withheld and Article 35, Changes In The Work.

If the Contractor does not remove such condemned or irreparably defective Work or material within a reasonable time, the Principal Representative may, after giving a second seven (7) day advance Notice to the Contractor and the Surety, remove them and may store the material at the Contractor’s expense. The Principal Representative may accomplish the removal and replacement with its own forces or with another Contractor. If the Contractor does not pay the expense of such removal and pay all storage charges within ten (10) days thereafter, the Principal Representative may, upon ten (10) days’ written Notice, sell such material at auction or at private sale and account for the net proceeds thereof, after deducting all costs and expenses which should have been borne by the Contractor. If the Contractor shall commence and diligently pursue such removal and replacement before the expiration of the seven-day period, or if the Contractor shall show good cause in conjunction with submittal of a revised CPM schedule showing when the Work will be performed and why such removal of condemned Work should be scheduled for a later date, the Principal Representative shall not proceed to remove or replace the condemned Work.

If the Contractor disagrees with the Notice to remove Work or materials condemned or declared irreparably defective, the Contractor may request facilitated negotiation of the issue and the Principal Representative’s right to proceed with removal and to deduct costs and expenses of repair shall be suspended and tolled until such time as the parties meet and negotiate the issue.

During construction, whenever the Architect/Engineer has advised the Contractor in writing, in the Specifications, by reference to Article 6, Architect/Engineer Decisions and Judgments, of these
General Conditions or elsewhere in the Contract Documents of a need to observe materials in place prior to their being permanently covered up, it shall be the Contractor’s responsibility to notify the Architect/Engineer at least forty-eight (48) hours in advance of such covering operation. If the Contractor fails to provide such notification, Contractor shall, at his or her expense, uncover such portions of the Work as required by the Architect/Engineer for observation, and reinstall such covering after observation. When a covering operation is continued from day to day, notification of the commencement of a single continuing covering operation shall suffice for the activity specified so long as it proceeds regularly and without interruption from day to day, in which event the Contractor shall coordinate with the Architect/Engineer regarding the continuing covering operation.

PART 34 - ARTICLE 31 APPLICATIONS FOR PAYMENTS

SCHEDULE 0 - CONTRACTOR’S SUBMITTALS

On or before the first day of each month and no more than five days prior thereto, the Contractor may submit applications for payment for the Work performed during such month covering the portion of the Work completed as of the date indicated, and payments on account of this Contract shall be due per C.R.S. § 24-30-202(24) (correct notice of amount due), within forty-five (45) days of receipt by the Principal Representative of application for payments that have been certified by the Architect/Engineer. The Contractor shall submit the application for payment to the Architect/Engineer on State forms SBP-7.2, Certificate for Contractor’s Payment, or such other format as the State Buildings Program shall approve, in an itemized format in accordance with the schedule of values or a cost loaded CPM schedule when required, supported to the extent reasonably required by the Architect/Engineer or the Principal Representative by receipts or other vouchers, showing payments for materials and labor, prior payments and payments to be made to Subcontractors and such other evidence of the Contractor’s right to payments as the Architect/Engineer or Principal Representative may direct.

If payments are made on account of materials not incorporated in the Work but delivered and suitably stored at the site, or at some other location agreed upon in writing, such payments shall be conditioned upon submission by the Contractor of bills of sale or such other procedure as will establish the Principal Representative’s title to such material or otherwise adequately protect the Principal Representative’s interests, and shall provide proof of insurance whenever requested by the Principal Representative or the Architect/Engineer, and shall be subject to the right to inspect the materials at the request of either the Architect/Engineer or the Principal Representative.

All applications for payment, except the final application, and the payments there under, shall be subject to correction in the next application rendered following the discovery of any error.

SCHEDULE 1 - ARCHITECT/ENGINEER CERTIFICATION

In accordance with the Architect/Engineer’s agreement with the Principal Representative, the Architect/Engineer after appropriate observation of the progress of the Work shall certify to the Principal Representative the amount that the Contractor is entitled to, and forward the application to the Principal Representative. If the Architect/Engineer certifies an amount different from the amount requested or otherwise alters the Contractor’s application for payment, a copy shall be forwarded to the Contractor.
If the Architect/Engineer is unable to certify all or portions of the amount requested due to the absence or lack of required supporting evidence, the Architect/Engineer shall advise the Contractor of the deficiency. If the deficiency is not corrected at the end of ten (10) days, the Architect/Engineer may either certify the remaining amounts properly supported to which the Contractor is entitled, or return the application for payment to the Contractor for revision with a written explanation as to why it could not be certified.

SCHEDULE 2 - RETAINAGE WITHHELD

Unless otherwise provided in the Supplementary General Conditions, an amount equivalent to five percent (5%) of the amount shown to be due the Contractor on each application for payment shall be withheld until the Work required by the Contract has been performed. The withheld percentage of the contract price of any such Work, improvement, or construction shall be administered according to C.R.S. § 24-91-103, as amended, and C.R.S. § 38-26-107, as amended, and Article 31.4, shall be retained until the Work or discrete portions of the Work, have been completed satisfactorily, finally or partially accepted, and advertised for final settlement as further provided in Article 41.

SCHEDULE 3 - RELEASE OF RETAINAGE

The Contractor may, for satisfactory and substantial reasons shown to the Principal Representative’s satisfaction, make a written request to the Principal Representative and the Architect/Engineer for release of part or all of the withheld percentage applicable to the Work of a Subcontractor which has completed the subcontracted Work in a manner finally acceptable to the Architect/Engineer, the Contractor, and the Principal Representative. Any such request shall be supported by a written approval from the Surety furnishing the Contractor’s bonds and any surety that has provided a bond for the Subcontractor. The release of any such withheld percentage shall be further supported by such other evidence as the Architect/Engineer or the Principal Representative may require, including but not limited to, evidence of prior payments made to the Subcontractor, copies of the Subcontractor’s contract with the Contractor, any applicable warranties, as-built information, maintenance manuals and other customary close-out documentation. Neither the Principal Representative nor the Architect Engineer shall be obligated to review such documentation nor shall they be deemed to assume any obligations to third parties by any review undertaken.

The Contractor’s obligation under these General Conditions to guarantee Work for one year from the date of the Notice of Substantial Completion or the date of any Notice of Partial Substantial Completion of the applicable portion or phase of the Project, shall be unaffected by such partial release; unless a Notice of Partial Substantial Completion is issued for the Work subject to the release of retainage.

Any rights of the Principal Representative which might be terminated by or from the date of any final acceptance of the Work, whether at common law or by the terms of this Contract, shall not be affected by such partial release of retainage prior to any final acceptance of the entire Project.

The Contractor remains fully responsible for the Subcontractor’s Work and assumes any risk that might arise by virtue of the partial release to the Subcontractor of the withheld percentage, including the risk that the Subcontractor may not have fully paid for all materials, labor and equipment furnished to the Project.
If the Principal Representative considers the Contractor’s request for such release satisfactory and supported by substantial reasons, the Architect/Engineer shall make a “final inspection” of the applicable portion of the Project to determine whether the Subcontractor’s Work has been completed in accordance with the Contract Documents. A final punch list shall be made for the Subcontractor’s Work and the procedures of Article 41, Completion, Final Inspection, Acceptance and Settlement, shall be followed for that portion of the Work, except that advertisement of the intent to make final payment to the Subcontractor shall be required only if the Principal Representative has reason to believe that a supplier or Subcontractor to the Subcontractor for which the request is made, may not have been fully paid for all labor and materials furnished to the Project.

PART 35 - ARTICLE 32  CERTIFICATES FOR PAYMENTS

State Form SBP-7.2, Certificate For Contractor’s Payment, and its continuation detail sheets, when submitted, shall constitute the Certificate of Contractor’s Application for Payment, and shall be a representation by the Contractor to the Principal Representative that the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and materials for which payment is requested have been incorporated into the Project except as noted in the application. If requested by the Principal Representative the Certificate of Contractor’s Application for Payment shall be sworn under oath and notarized.

PART 36 - ARTICLE 33  PAYMENTS WITHHELD

The Architect/Engineer, the Principal Representative or State Buildings Program may withhold, or on account of subsequently discovered evidence nullify, the whole or any part of any application on account of, but not limited to any of the following:

a) Defective Work not remedied;

b) Claims filed or reasonable evidence indicating probable filing of claims;

c) Failure of the Contractor to make payments to Subcontractors for material or labor;

d) A reasonable doubt that the Contract can be completed for the balance of the contract price then unpaid;

e) Damage or injury to another contractor or any other person, persons or property except to the extent of coverage by a policy of insurance;

f) Failure to obtain necessary permits or licenses or to comply with applicable laws, ordinances, codes, rules or regulations or the directions of the Architect/Engineer;

g) Failure to submit a monthly construction schedule;

h) Failure of the Contractor to keep Work progressing in accordance with the time schedule;

i) Failure to keep a superintendent on the Work;

j) Failure to maintain as built drawings of the Work in progress;

k) Unauthorized deviations by the Contractor from the Contract Documents; or
I) On account of liquidated damages.

In addition, the Architect Engineer, Principal Representative or State Buildings Program may withhold or nullify the whole or any part of any application for any reason noted elsewhere in these General Conditions of the Contractor’s Design/Bid/Build Agreement. Nullification shall mean reduction of amounts shown as previously paid on the application. The amount withheld or nullified may be in such amount as the Architect/Engineer or the Principal Representative estimates to be required to allow the State to accomplish the Work, cure the failure and cover any damages or injuries, including an allowance for attorneys’ fees and costs where appropriate. When the grounds for such withholding or nullifying are removed, payment shall be made for the amounts thus withheld or nullified on such grounds.

PART 37 - ARTICLE 34  DEDUCTIONS FOR UNCORRECTED WORK

If the Architect/Engineer and the Principal Representative deem it inexpedient to correct Work damaged or not performed in accordance with the Contract Documents, the Principal Representative may, after consultation with the Architect/Engineer and ten (10) days’ Notice to the Contractor of intent to do so, make reasonable reductions from the amounts otherwise due the Contractor on the next application for payment. Notice shall specify the amount or terms of any contemplated reduction. The Contractor may during this period correct or perform the Work. If the Contractor does not correct or perform the Work, an equitable deduction from the Contract sum shall be made by Change Order, in accordance with Article 35, Changes in The Work, unilaterally if necessary. If either party elects’ facilitation of this issue after Notice is given, the ten-day (10) notice period shall be extended and tolled until facilitation has occurred.

PART 38 - ARTICLE 35  CHANGES IN THE WORK

The Principal Representative may designate, without invalidating the Agreement, and with the approval of State Buildings Program and the State Controller, may order extra Work or make changes with or without the consent of the Contractor as hereafter provided, by altering, adding to or deducting from the Work, the Contract sum being adjusted accordingly. All such changes in the Work shall be within the general scope of and be executed under the conditions of the Contract, except that any claim for extension of time made necessary due to the change or any claim of other delay or other impacts caused by or resulting from the change in the Work shall be presented by the Contractor and adjusted by Change Order to the extent known at the time such change is ordered and before proceeding with the extra or changed Work. Any claims for extension of time or of delay or other impacts, and any costs associated with extension of time, delay or other impacts, which are not presented before proceeding with the change in the Work, and which are not adjusted by Change Order to the extent known, shall be waived.

The Architect/Engineer shall have authority to make minor changes in the Work, not involving extra cost, and not inconsistent with the intent of the Contract Documents, but otherwise, except in an emergency endangering life or property, no extra Work or change in the Contract Documents shall be made unless by 1) a written Change Order, approved by the Principal
Representative, State Buildings Program, and the State Controller prior to proceeding with the changed Work; or 2) by an Emergency Field Change Order approved by the Principal Representative and State Buildings Program as hereafter provided in Article 35.4 Emergency Field Ordered Changed Work; or 3) by an allocation in writing of any allowance already provided in the encumbered contract amount, the Contract sum being later adjusted to decrease the Contract sum by any unallocated or unexpended amounts remaining in such allowance. No change to the Contract sum shall be valid unless so ordered.

SCHEDULE 0 - THE VALUE OF CHANGED WORK

The value of any extra Work or changes in the Work shall be determined by agreement in one or more of the following ways:

a) By estimate and acceptance of a lump-sum amount;

b) By unit prices specified in the Agreement, or subsequently agreed upon, that are extended by specific quantities;

c) By actual cost plus a fixed fee in a lump sum amount for profit, overhead and all indirect and off-site home office costs, the latter amount agreed upon in writing prior to starting the extra or changed Work.

Where the Contractor and the Principal Representative cannot agree on the value of extra Work, the Principal Representative may order the Contractor to perform the changes in the Work and a Change Order may be unilaterally issued based on an estimate of the change in the Work prepared by the Architect/Engineer. The value of the change in the Work shall be the Principal Representative’s determination of the amount of equitable adjustment attributable to the extra Work or change. The Principal Representative’s determination shall be subject to appeal by the Contractor pursuant to the claims process in Article 36, Claims.

Except as otherwise provided in Article 35.2, Detailed Breakdown, the Cost Principles of the Colorado Procurement Code or the applicable procurement code for institutions of higher education, shall govern all Contract changes.

SCHEDULE 1 - DETAILED BREAKDOWN

In all cases where the value of the extra or changed Work is not known based on unit prices in the Contractor’s bid or the Agreement, a detailed change proposal shall be submitted by the Contractor on a Change Order Proposal (SC-6.312), or in such other format as the State Buildings Program approves, with which the Principal Representative may require an itemized list of materials, equipment and labor, indicating quantities, time and cost for completion of the changed Work.

Such detailed change proposals shall be stated in lump sum amounts and shall be supported by a separate breakdown, which shall include estimates of all or part of the following when requested by the Architect/Engineer or the Principal Representative:

a) Materials, indicating quantities and unit prices including taxes and delivery costs if any (separated where appropriate into general, mechanical and electrical and/or other Subcontractors’ Work; and the Principal Representative may require in its discretion any significant subcontract costs to be similarly and separately broken down).
b) Labor costs, indicating hourly rates and time and labor burden to include Social Security and other payroll taxes such as unemployment, benefits and other customary burdens.

c) Costs of project management time and superintendency time of personnel stationed at the site, and other field supervision time, but only where a time extension, other than a weather delay, is approved as part of the Change Order, and only where such project management time and superintendency time is directly attributable to and required by the change; provided however that additional cost of on-site superintendency shall be allowable whenever in the opinion of the Architect/Engineer the impact of multiple change requests to be concurrently performed will result in inadequate levels of supervision to assure a proper result unless additional superintendence is provided.

Construction equipment (including small tools). Expenses for equipment and fuel shall be based on customary commercially reasonable rental rates and schedules. Equipment and hand tool costs shall not include the cost of items customarily owned by workers.

d) Workers’ compensation costs, if not included in labor burden.

e) The cost of commercial general liability and property damage insurance premiums but only to the extent charged the Contractor as a result of the changed Work.

f) Overhead and profit, as hereafter specified.

g) Builder’s risk insurance premium costs.

h) Bond premium costs.

i) Testing costs not otherwise excluded by these General Conditions.

j) Subcontract costs.

Unless modified in the Supplementary General Conditions, overhead and profit shall not exceed the percentages set forth in the table below.

<table>
<thead>
<tr>
<th></th>
<th>OVERHEAD</th>
<th>PROFIT</th>
<th>COMMISSION</th>
</tr>
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<tbody>
<tr>
<td>To the Contractor or to Subcontractors for the portion of Work performed with their own forces:</td>
<td>10%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>To the Contractor or to Subcontractors for Work performed by others at a tier immediately below either of them:</td>
<td>5%</td>
<td>0%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Overhead shall include: a) insurance premium for policies not purchased for the Project and itemized above, b) home office costs for office management, administrative and supervisory personnel and assistants, c) estimating and change order preparation costs, d) incidental job burdens, e) legal costs, f) data processing costs, g) interest costs on capital, h) general office expenses except those attributable to increased rental expenses for temporary facilities, and all other indirect costs, but shall not include the Social Security tax and other direct labor burdens. The term “Work” as used in the proceeding table shall include labor, materials and equipment and the "Commission" shall include all costs and profit for carrying the subcontracted Work at the tiers below except direct costs as listed in items (a) through (k) above if any.
On proposals for Work involving both additions and credits in the amount of the Contract sum, the overhead and profit will be allowed on the net increase only. On proposals resulting in a net deduct to the amount of the Contract sum, profit on the deducted amount shall be returned to the Principal Representative at fifty percent (50%) of the rate specified. The inadequacy of the profit specified shall not be a basis for refusal to submit a proposal.

Except in the case of Change Orders or Emergency Field Change Orders agreed to on the basis of a lump sum amount or unit prices as described in paragraphs 35.1a and 35.2a above, The Value of Changed Work, the Contractor shall keep and present a correct and fully auditable account of the several items of cost, together with vouchers, receipts, time cards and other proof of costs incurred, summarized on a Change Order form (SC-6.31) using such format for supporting documentation as the Principal Representative and State Buildings Program approve. This requirement applies equally to Work done by Subcontractors. Only auditable costs shall be reimbursable on Change Orders where the value is determined on the basis of actual cost plus a fixed fee pursuant to paragraph 35A3 above, or where unilaterally determined by the Principal Representative on the basis of an equitable adjustment in accordance with the Procurement Rules, as described above in Article 35.1, The Value of Changed Work.

Except for proposals for Work involving both additions and credits, changed Work shall be adjusted and considered separately for Work either added or omitted. The amount of adjustment for Work omitted shall be estimated at the time it is directed to be omitted, and when reasonable to do so, the agreed adjustment shall be reflected on the schedule of values used for the next Contractor’s application for payment.

The Principal Representative reserves the right to contract with any person or firm other than the Contractor for any or all extra Work; however, unless specifically required in the Contract Documents, the Contractor shall have no responsibility without additional compensation to supervise or coordinate the Work of persons or firms separately contracted by the Principal Representative.

SCHEDULE 2 - HAZARDOUS MATERIALS

The Principal Representative represents that it has undertaken an examination of the site of the Work and has determined that there are no hazardous substances, as defined below, which the Contractor could reasonably encounter in its performance of the Work. In the event the Principal Representative so discovers hazardous substances, the Principal Representative shall render harmless such hazards before the Contractor commences the Work.

In the event the Contractor encounters any materials reasonably believed to be hazardous substances which have not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Principal Representative, in writing. For purposes of this Agreement, "hazardous substances" shall include asbestos, lead, polychlorinated biphenyl (PCB) and any or all of those substances defined as "hazardous substance", "hazardous waste", or "dangerous or extremely hazardous wastes" as those terms are used in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA), and shall also include materials regulated by the Toxic Substances Control Act (TSCA), the Clean Air Act, the Air Quality Act, the Clean Water Act, and the Occupational Safety and Health Act. The Work in the affected area shall not therefore be resumed except by written agreement of the Principal Representative and the Contractor, if in fact materials that are hazardous substances have not been rendered harmless. The Work in the
affected area shall be resumed only in the absence of the hazardous substances or when it has
been rendered harmless or by written agreement of the Principal Representative and the
Contractor.

The contractor shall not be required to perform Work without consent in any areas where it
reasonably believes hazardous substances that have not been rendered harmless are present.

SCHEDULE 3 - EMERGENCY FIELD CHANGE ORDERED WORK

The Principal Representative, without invalidating the Agreement, and with the approval of State
Buildings Program and without the approval of the State Controller, may order extra Work or
make changes in the case of an emergency that is a threat to life or property or where the
likelihood of delays in processing a normal Change Order will result in substantial delays and or
significant cost increases for the Project. Emergency Field Orders are not to be used solely to
expedite normal Change Order processing absent a clear showing of a high potential for significant
and substantial cost or delay. Such changes in the Work may be directed through issuance of an
Emergency Field Change Order signed by the Contractor, the Principal Representative (or by a
designee specifically appointed to do so in writing), and approved by the Director of State
Buildings Program or his or her delegate. The change shall be directed using an Emergency Field
Change Order form (SC-6.31E).

If the amount of the adjustment of the Contract price and time for completion can be determined
at the time of issuance of the Emergency Field Change Order, those adjustments shall be reflected
on the face of the Emergency Field Change Order. Otherwise, the Emergency Field Change Order
shall reflect a not to exceed (NTE) amount for any schedule adjustment (increasing or decreasing
the time for completion) and an NTE amount for any adjustment to Contract sum, which NTE
amount shall represent the maximum amount of adjustment to which the Contractor will be
entitled, including direct and indirect costs of changed Work, as well as any direct or indirect costs
attributable to delays, inefficiencies or other impacts arising out of the change. Emergency Field
Change Orders directed in accordance with this provision need not bear the approval signatures
of the State Controller.

On Emergency Field Change Orders where the price and schedule have not been finally
determined, the Contractor shall submit final costs for adjustment as soon as practicable. No later
than seven (7) days after issuance, except as otherwise permitted, and every seven days
thereafter, the Contractor shall report all costs to the Principal Representative and the
Architect/Engineer. The final adjustment of the Emergency Field Change Order amount and the
adjustment to the Project time for completion shall be prepared on a normal Change Order from
(SC-6.31) in accordance with the procedures described in Article 35.1, The Value of Changed
Work, and B, Detailed Breakdown, above. Unless otherwise provided in writing signed by the
Director of State Buildings Program to the Principal Representative and the Contractor, describing
the extent and limits of any greater authority, individual Emergency Field Change Orders shall not
be issued for more than $25,000, nor shall the cumulative value of Emergency Field Change Orders
exceed an amount of $100,000.

SCHEDULE 4 - APPROPRIATION LIMITATIONS - C.R.S. § 24-91-103.6, as amended

The amount of money appropriated, as shown on the Contractor’s Design/Bid/Build Agreement
(SC 6.21), is equal to or in excess of the Contract amount. No Change Order, Emergency Field
Change Order, or other type of order or directive shall be issued by the Principal Representative,
or any agent acting on his or her behalf, which directs additional compensable Work to be performed, which Work causes the aggregate amount payable under the Contract to exceed the amount appropriated for the original Contract, as shown on the Agreement (SC-6.21), unless one of the following occurs: (1) the Contractor is provided written assurance from the Principal Representative that sufficient additional lawful appropriations exist to cover the cost of the additional Work; or (2) the Work is covered by a contractor remedy provision under the Contract, such as a claim for extra cost. By way of example only, no assurance is required for any order, directive or instruction by the Architect/Engineer or the Principal Representative to perform Work which is determined to be within the performance required by the Contract Documents; the Contractor’s remedy shall be as described elsewhere in these General Conditions.

Written assurance shall be in the form of an Amendment to the Contract reciting the source and amount of such appropriation available for the Project. No remedy granting provision of this Contract shall obligate the Principal Representative to seek appropriations to cover costs in excess of the amounts recited as available to pay for the Work to be performed.

PART 39 - ARTICLE 36 CLAIMS

It is the intent of these General Conditions to provide procedures for speedy and timely resolution of disagreements and disputes at the lowest level possible. In the spirit of on the job resolution of job site issues, the parties are encouraged to use the partnering processes of Article 2.4, Partnering, Communications and Cooperation, before turning to the more formal claims processes described in this Article 36, Claims. The use of non-binding dispute resolution, whether through the formal processes described in Article 39, Non-Binding Dispute Resolution – Facilitated Negotiations, or through less formal alternative processes developed as part of a partnering plan, are also encouraged. Where such process cannot resolve the issues in dispute, the claims process that follows is intended to cause the issues to be presented, decided and where necessary, documented in close proximity to the events from which the issues arise. To that end, and in summary of the remedy granting process that follows commencing with the next paragraph of this Article 36, Claims, the Contractor shall 1) first, seek a decision by the Architect/Engineer, and 2) shall second, informally present the claim to Principal Representative as described hereafter, and 3) failing resolution in the field, give Notice of intent to exercise statutory rights of review of a formal contract controversy, and 4) seek resolution outside the Contract as provided by the Colorado Procurement Code or the applicable procurement code for institutions of higher education.

If the Contractor claims that any instructions, by detailed drawings, or otherwise, or any other act or omission of the Architect/Engineer or Principal Representative affecting the scope of the Contractor’s Work, involve extra cost, extra time or changes in the scope of the Work under this Contract, the Contractor shall have the right to assert a claim for such costs or time, provided that before either proceeding to execute such Work (except in an emergency endangering life or property), or filing a Notice of claim, the Contractor shall have obtained or requested a written decision of the Architect/Engineer following the procedures as provided in Article 6.1 and 6.2, Architect/Engineer Decisions and Judgments, respectively; provided, however, that in the case of a directed change in the Work pursuant to Article 35, no written judgment or decision of the Architect/Engineer is required. If the Contractor is delayed by the lack of a response to a request
for a decision by the Architect/Engineer, the Contractor shall give Notice in accordance with Article 38, Delays and Extensions of Time.

Unless it is the Architect/Engineer’s judgment and determination that the Work is not included in the performance required by the Contract Documents, the Contractor shall proceed with the Work as originally directed. Where the Contractor’s claim involves a dispute concerning the value of Work unilaterally directed pursuant to Article 35.1, the Contractor shall also proceed with the Work as originally directed while his or her claim is being considered.

The Contractor shall give the Principal Representative and the Architect/Engineer Notice of any claim promptly after the receipt of the Architect/Engineer’s decision, but in no case later than three (3) business days after receipt of the Architect/Engineer’s decision (or no later than ten (10) days from the date of the Contractor’s request for a decision when the Architect/Engineer fails to decide as provided in Article 6). The Notice of claim shall state the grounds for the claim and the amount of the claim to the extent known in accordance with the procedures of Article 35, Changes in the Work. The period in which Notice must be given may be extended by the Principal Representative if requested in writing by the Contractor with good cause shown, but any such extension to be effective shall be in writing.

The Principal Representative shall respond in writing, with a copy to the Architect/Engineer, within a reasonable time, and except where a request for facilitation of negotiation has been made as hereafter provided, in no case later than seven (7) business days (or at such other time as the Contractor and Principal Representative agree) after receipt of the Contractor’s Notice of claim regarding such instructions or alleged act or omission. If no response to the Contractor’s claim is received within seven (7) business days of Contractor’s Notice (or at such other time as the Contractor and Principal Representative agree) and the instructions have not been retracted, it shall be deemed that the Principal Representative has denied the claim.

The Principal Representative may grant or deny the claim in whole or in part, and a Change Order shall be issued if the claim is granted. To the extent any portion of claim is granted where costs are not clearly shown, the Principal Representative may direct that the value of that portion of the Work be determined by any method allowed in Article 35.1, The Value of Changed Work. Except in the case of a deemed denial, the Principal Representative shall provide a written explanation regarding any portion of the Contractor’s claim that is denied.

If the Contractor disagrees with the Principal Representative’s judgment and determination on the claim and seeks an equitable adjustment of the Contract sum or time for performance, he or she shall give Notice of intent to exercise his or her statutory right to seek a decision on the contract controversy within ten (10) days of receipt of the Principal Representative’s decision denying the claim. A “contract controversy,” as such term is used in the Colorado Procurement Code or the applicable procurement code for institutions of higher education, shall not arise until the initial claim process described above in this Article 36 has been properly exhausted by the Contractor. The Contractor’s failure to proceed with Work directed by the Architect/Engineer or to exhaust the claim process provided above in this Article 36, shall constitute an abandonment of the claim by the Contractor and a waiver of the right to contest the decision in any forum.

At the time of filing the Notice of intent to exercise his or her statutory right to seek a decision on the contract controversy, the Contractor may request that the Principal Representative defer a decision on the contract controversy until a later date or until the end of the Project. If the Principal Representative agrees, he or she shall so advise the Contractor in writing. If no such
request is made, or if the Principal Representative does not agree to such a request, the Principal Representative shall render a written decision within twenty (20) business days and advise the Contractor of the reasons for any denial. Unless the claim has been decided by the Principal Representative (as opposed to delegates of the Principal Representative), the person who renders the decision on this statutory contract controversy shall not be the same person who decided the claim. To the extent any portion of the contract controversy is granted where costs are not clearly shown, the Principal Representative may direct that the value of that portion of the Work be determined by any method allowed in Article 35.1, The Value of Changed Work. In the event of a denial, the Principal Representative shall give Notice to the Contractor of his or her right to administrative and judicial reviews as provided in the Colorado Procurement Code or the applicable procurement code for institutions of higher education. If no decision regarding the contract controversy is issued within twenty (20) business days of the Contractor’s giving Notice (or such other date as the Contractor and Principal Representative have agreed), and the instructions have not been retracted or the alleged act or omission have not been corrected, it shall be deemed that the Principal Representative has ruled by denial on the contract controversy. Except in the case of a deemed denial, the Principal Representative shall provide an explanation regarding any portion of the contract controversy that involves denial of the Contractor’s claim.

Either the Contractor or the Principal Representative may request facilitation of negotiations concerning the claim or the contract controversy, and if requested, the parties shall consult and negotiate before the Principal Representative decides the issue. Any request for facilitation by the Contractor shall be made at the time of the giving of Notice of the claim or Notice of the contract controversy. Facilitation shall extend the time for the Principal Representative to respond by commencing the applicable period at the completion of the facilitated negotiation, which shall be the last day of the parties’ meeting, unless otherwise agreed in writing.

Disagreement with the decision of the Architect Engineer, or the decision of the Principal Representative to deny any claim or denying the contract controversy, shall not be grounds for the Contractor to refuse to perform the Work directed or to suspend or terminate performance. During the period that any claim or contract controversy decision is pending under this Article 36, Claims, the Contractor shall proceed diligently with the Work directed.

In all cases where the Contractor proceeds with the Work and seeks equitable adjustment by filing a claim and or statutory appeal, the Contractor shall keep a correct account of the extra cost, in accordance with Article 35.2, Detailed Breakdown supported by receipts. The Principal Representative shall be entitled to reject any claim or contract controversy whenever the foregoing procedures are not followed and such accounts and receipts are not presented.

The payments to the Contractor in respect of such extra costs shall be limited to reimbursement for the current additional expenditure by the Contractor made necessary by the change in the Work, plus a reasonable amount for overhead and profit, determined in accordance with Article 35.2, Detailed Breakdown, determined solely with reference to the additional Work, if any, required by the change.
PART 40 - ARTICLE 37  DIFFERING SITE CONDITIONS

SCHEDULE 0 - NOTICE IN WRITING

The Contractor shall promptly, and where possible before conditions are disturbed, give the Architect/Engineer and the Principal Representative Notice in writing of:

a) Subsurface or latent physical conditions at the site differing materially from those indicated in or reasonably assumed from the information provided in the Contract Documents; and,

b) Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents.

The Architect/Engineer shall promptly investigate the conditions, and if it is found that such conditions do materially so differ and cause an increase or decrease in the Contractor’s costs of performance of any part of the Work required by the Contract Documents, whether or not such Work is changed as a result of such conditions, an equitable adjustment shall be made and the Contract sum shall be modified in accordance with Article 35, Changes in the Work.

If the time required for completion of the Work affected by such materially differing conditions will extend the Work on the critical path as indicated on the CPM schedule, the time for completion shall also be equitably adjusted.

SCHEDULE 1 - LIMITATIONS

No claim of the Contractor under this clause shall be allowed unless the Contractor has given the Notice required in Article 37.1, Notice in Writing, above. The time prescribed for presentation and adjustment in Articles 36, Claims and 38, Delays and Extensions of Time, shall be reasonably extended by the State to the extent required by the nature of the differing conditions; provided, however, that even when so extended no claim by the Contractor for an equitable adjustment hereunder shall be allowed if not quantified and presented prior to the date the Contractor requests a final inspection pursuant to Article 41.1, Notice of Completion.

PART 41 - ARTICLE 38  DELAYS AND EXTENSIONS OF TIME

If the Contractor is delayed at any time in the progress of the Work by any act or neglect of the State of Colorado or the Architect/Engineer, or of any employee or agent of either, or by any separately employed Contractor or by strikes, lockouts, fire, unusual delay in transportation, unavoidable casualties or any other causes beyond the Contractor’s control, including weather delays as defined below, the time of Completion of the Work shall be extended for a period equal to such portion of the period of delays directly affecting the completion of the Work as the Contractor shall be able to show he or she could not have avoided by the exercise of due diligence.

The Contractor shall provide Notice in writing to the Architect/Engineer, the Principal Representative and State Buildings Program within three (3) business days from the beginning of such delay and shall file a written claim for an extension of time within seven (7) business days after the period of such delay has ceased, otherwise, any claim for an extension of time is waived.
Provided that the Contractor has submitted reasonable schedules for approval when required by Article 12, Requests for Information and Schedules, if no schedule is agreed to fixing the dates on which the responses to requests for information or detail drawings will be needed, or Shop Drawings, Product Data or Samples are to be reviewed as required or allowed by Article 12.2, Schedules, no extension of time will be allowed for the Architect/Engineer’s failure to furnish such detail drawings as needed, or for the failure to initially review Shop Drawings, Product Data or Samples, except in respect of that part of any delay in furnishing detail drawings or instructions extending beyond a reasonable period after written demand for such detailed drawings or instructions is received by the Architect/Engineer. In any event, any claim for an extension of time for such cause will be recognized only to the extent of delay directly caused by failure to furnish detail drawings or instructions or to review Shop Drawings, Product Data or Samples pursuant to schedule, after such demand.

All claims for extension of time due to a delay claimed to arise or result from ordered changes in the scope of the Work, or due to instructions claimed to increase the scope of the Work, shall be presented to the Architect/Engineer, the Principal Representative and State Buildings Program as part of a claim for extra cost, if any, in accordance with Article 36, Claims, and in accordance with the Change Order procedures required by Article 35, Changes in The Work.

Except as otherwise provided in this paragraph, no extension of time shall be granted when the Contractor has failed to utilize a CPM schedule or otherwise identify the Project’s critical path as specified in Article 12, Requests for Information and Schedules, or has elected not to do so when allowed by the Supplementary General Conditions or the Specifications to use less sophisticated scheduling tools, or has failed to maintain such a schedule. Delay directly affecting the completion of the Work shall result in an extension of time only to the extent that completion of the Work was affected by impacts to the critical path shown on Contractor’s CPM schedule. Where the circumstances make it indisputable in the opinion of the Architect/Engineer that the delay affected the completion of the Work so directly that the additional notice of the schedule impact by reference to a CPM schedule was unnecessary, a reasonable extension of time may be granted.

Extension of the time for completion of the Work will be granted for delays due to weather conditions only when the Contractor demonstrates that such conditions were more severe and extended than those reflected by the ten-year average for the month, as evidenced by the Climatological Data, U. S. Department of Commerce, for the Project area.

Extensions of the time for completion of the Work due to weather will be granted on the basis of one and three tenths (1.3) calendar days for every day that the Contractor would have Worked but was unable to Work, with each separate extension figured to the nearest whole calendar day.

For weather delays and delays caused by events, acts or omissions not within the control of the Principal Representative or any person acting on the Principal Representative’s behalf, the Contractor shall be entitled to an extension of time only and shall not be entitled to recovery of additional cost due to or resulting from such delays. This Article does not, however, preclude the recovery of damages for delay by either party under other provisions in the Contract Documents.
PART 42 - ARTICLE 39  NON-BINDING DISPUTE RESOLUTION – FACILITATED NEGOTIATIONS

The Contractor and Principal Representative agree to designate one or more mutually acceptable persons willing and able to facilitate negotiations and communications for the resolution of conflicts, disagreements or disputes between them at the specific request of either party with regard to any Project decision of either of them or any decision of the Architect/Engineer. The designation of such person(s) shall not carry any obligation to use their services except that each party agrees that if the other party requests the intervention of such person(s) with respect to any such conflict, dispute or disagreement, the non-requesting party shall participate in good faith attempts to negotiate a resolution of the issue in dispute. If the parties cannot agree on a mutually acceptable person to serve in this capacity one shall be so appointed; provided, however, that either party may request the director of State Buildings Program to appoint such a person, who, if appointed, shall be accepted for this purpose by both the Contractor and the Principal Representative.

The cost, if any, of the facilitative services of the person(s) so designated shall be shared if the parties so agree in any partnering plan; or in the absence of agreement the cost shall be borne by the party requesting the facilitation of negotiation.

Any dispute, claim, question or disagreement arising from or relating to the Contract or an alleged breach of the Contract may be subject to a request by either party for facilitated negotiation subject to the limitations hereafter listed, and the parties shall participate by consultation and negotiation with each other, as guided by the facilitator and with recognition of their mutual interests, in an attempt to reach an equitable solution satisfactory to both parties.

The obligation to participate in facilitated negotiations shall be as described above and elsewhere in these General Conditions, as by way of example in Article 36, Claims, or Article 34, Deductions for Uncorrected Work and to the extent not more particularly described or limited elsewhere, each party’s obligations shall be as follows:

a) A party shall not initiate communication with the facilitator regarding the issues in dispute; except that any request for facilitation shall be made in writing with copies sent, faxed or delivered to the other party;

b) A party shall prepare a brief written description of its position if so requested by the facilitator (who may elect to first discuss the parties’ positions with each party separately in the interest of time and expense);

c) A party shall respond to any reasonable request for copies of documents requested by the facilitator, but such requests, if voluminous, may consist of an offer to allow the facilitator access to the parties’ documents;

d) A party shall review any meeting agenda proposed by a facilitator and endeavor to be informed on the subjects to be discussed;

e) A party shall meet with the other party and the facilitator at a mutually acceptable place and time, or, if none can be agreed to, at the time and place designated by the facilitator for a period not to exceed four hours unless the parties agree to a longer period;

f) A party shall endeavor to assure that any facilitation meeting shall be attended by any other persons in their employ that the facilitator requests be present, if reasonably available, including the Architect/Engineer;
g) Each party shall participate in such facilitated face-to-face negotiations of the issues in dispute through persons fully authorized to resolve the issue in dispute;

h) Each party shall be obligated to participate in negotiations requested by the other party and to perform the specific obligations described in paragraphs (a) through (j) this Article 39, Facilitated Negotiation, no more than three times during the course of the Project;

i) Neither party shall be under any obligation to resolve any issue by facilitated negotiation, but each agrees to participate in good faith and the Principal Representative shall direct the Architect/Engineer to appropriately document any resolution or agreement reached and to execute any Amendment or Change Order to the Contract necessary to implement their agreement; and,

j) Any discussions and documents prepared exclusively for use in the negotiations shall be deemed to be matters pertaining to settlement negotiations and shall not be subsequently available in further proceedings except to the extent of any documented agreement.

In accordance with State Fiscal Rules and Article 52.6, Choice of Law; No Arbitration, nothing in this Article 39 shall be deemed to call for arbitration or otherwise obligate the State to participate in any form of binding alternative dispute resolution.

A partnering plan developed as described in Article 2.4, Partnering, Communications and Cooperation, may modify or expand the requirements of this Article but may not reduce the obligation to participate in facilitated negotiations when applicable. In the case of small projects estimated to be valued under $500,000, the requirements of this Article may be deleted from this Contract, by modification in Article 7 (Contractor’s Agreement SC-6.21), Optional Provisions and Elections. When so modified, the references to the parties’ right to elect facilitated negotiation elsewhere in these General Conditions shall be deleted.

PART 43 - ARTICLE 40  RIGHT OF OCCUPANCY

The Principal Representative shall have the right to take possession of and to use any completed or partially completed portions of the Work, even if the time for completing the entire Work or portions of the Work has not expired and even if the Work has not been finally accepted, and the Contractor shall fully cooperate with the Principal Representative to allow such possession and use. Such possession and use shall not constitute an acceptance of such portions of the Work.

Prior to any occupancy of the Project, an inspection shall be made by the Principal Representative, State Buildings Program and the Contractor. Such inspection shall be made for the purpose of ensuring that the building is secure, protected by operation safety systems as designed, operable exits, power, lighting and HVAC systems, and otherwise ready for the occupancy intended and the Notice of Substantial Completion has been issued for the occupancy intended. The inspection shall also document existing finish conditions to allow assessment of any damage by occupants. The Contractor shall assist the Principal Representative in completing and executing State Form SBP-01, Approval of Occupancy/Use, prior to the Principal Representative’s possession and use. Any and all areas so occupied will be subject to a final inspection when the Contractor complies with Article 41, Completion, Final Inspection, Acceptance and Settlement.
PART 44 - ARTICLE 41   COMPLETION, FINAL INSPECTION, ACCEPTANCE AND SETTLEMENT

SCHEDULE 0 - NOTICE OF COMPLETION

When the Work, or a discrete physical portion of the Work (as hereafter described) which the Principal Representative has agreed to accept separately, is substantially complete and ready for final inspection, the Contractor shall file a written Notice with the Architect/Engineer that the Work, or such discrete physical portion, in the opinion of the Contractor, is substantially complete under the terms of the Contract. The Contractor shall prepare and submit with such Notice a comprehensive list of items to be completed or corrected prior to final payment, which shall be subject to review and additions as the Architect/Engineer or the Principal Representative shall determine after inspection. If the Architect/Engineer or the Principal Representative believe that any of the items on the list of items submitted, or any other item of Work to be corrected or completed, or the cumulative number of items of Work to be corrected or completed, will prevent a determination that the Work is substantially complete, those items shall be completed by the Contractor and the Notice shall then be resubmitted.

SCHEDULE 1 - FINAL INSPECTION

Within ten (10) days after the Contractor files written Notice that the Work is substantially complete, the Architect/Engineer, the Principal Representative, and the Contractor shall make a “final inspection” of the Project to determine whether the Work is substantially complete and has been completed in accordance with the Contract Documents. State Buildings Program shall be notified of the inspection not less than three (3) business days in advance of the inspection. The Contractor shall provide the Principal Representative and the Architect/Engineer an updated punch list in sufficient detail to fully outline the following:

a) Work to be completed, if any; and

b) Work not in compliance with the Drawings or Specifications, if any.

A final punch list shall be made by the Architect/Engineer in sufficient detail to fully outline to the Contractor:

a) Work to be completed, if any;

b) Work not in compliance with the Drawings or Specifications, if any; and

c) Unsatisfactory Work for any reason, if any.

The required number of copies of the final punch list will be countersigned by the authorized representative of the Principal Representative and will then be transmitted by the Architect/Engineer to the Contractor, the Principal Representative, and State Buildings Program. The Architect/Engineer's final punch list shall control over the Contractor's preliminary punch list.

SCHEDULE 2 - NOTICE OF SUBSTANTIAL COMPLETION

Notice of Substantial Completion shall establish the date of substantial completion of the Project. The Contractor acknowledges and agrees that because the departments, agencies and institutions of the State of Colorado are generally involved with the business of the public at large, greater care must be taken in establishing the date of substantial completion than might otherwise be the case to ensure that a project or building or discrete physical portion of the Work is fully usable.
and safe for public use, and that such care necessarily raises the standard by which the concept of substantial completion is applied for a public building.

The Notice of Substantial Completion shall not be issued until the following have been fully established:

a) All required building code inspections have been called for and the appropriate code officials have affixed their signatures to the Building Inspection Record indicating successful completion of all required code inspections;

b) All required corrections noted on the Building Inspection Record shall have been completed unless the Architect/Engineer, the Principal Representative and State Buildings Program, in their complete and absolute discretion, all concur that the condition requiring the remaining correction is not in any way life threatening, does not otherwise endanger persons or property, and does not result in any undue inconvenience or hardship to the Principal Representative or the public;

c) The building, structure or Project can be fully and comfortably used by the Principal Representative and the public without undue interference by the Contractor’s employees and Workers during the completion of the final punch list taking into consideration the nature of the public uses intended and taking into consideration any stage or level of completion of HVAC system commissioning or other system testing required by the Specifications to be completed prior to issuance of the Notice of Substantial Completion;

d) The Project has been fully cleaned as required by these General Conditions, and as required by any stricter requirements of the Specifications, and the overall state of completion is appropriate for presentation to the public; and

The Contractor has provided a schedule for the completion of each and every item identified on the punch list which specifies the Subcontractor or trade responsible for the Work, and the dates the completion or correction of the item will be commenced and finished; such schedule will show completion of all remaining final punch list items within the period indicated in the Contract for final punch list completion prior to Final Acceptance, with the exception of only those items which are beyond the control of the Contractor despite due diligence. The schedule shall provide for a reasonable punch list inspection process. Unless liquidated damages have been specified in Article 7.6 of the Contractor’s Design/Bid/Build Agreement SC-6.21), the cost to the Principal Representative, if any, for re-inspections due to failure to adhere to the Contractor’s proposed punch-list completion schedule shall be the responsibility of the Contractor and may be deducted by the Principal Representative from final amounts due to the Contractor.

Substantial completion of the entire Project shall not be conclusively established by a decision by the Principal Representative to take possession and use of a portion, or all of the Project, where portions of the Project cannot meet all the criteria noted above. Notice of Substantial Completion for the entire Project shall, however, only be withheld for substantial reasons when the Principal Representative has taken possession and uses all of the Project in accordance with the terms of Article 40, Right of Occupancy. Failure to furnish the required completion schedule shall constitute a substantial reason for withholding the issuance of any Notice of Substantial Completion.

The Contractor shall have the right to request a final inspection of any discrete physical portion of the Project when in the opinion of the Principal Representative, The Architect/Engineer and
State Buildings Program a final punch list can be reasonably prepared, without confusion as to which portions of the Project are referred to in any subsequent Notice of Partial Final Settlement which might be issued after such portion is finally accepted. Discrete physical portions of the Project may be, but shall not necessarily be limited to, such portions of the Project as separate buildings where a Project consists of multiple buildings. Similarly, an addition to an existing building where the Project also calls for renovation or remodeling of the existing building may constitute a discrete physical portion of the Project. In such circumstances, when in the opinion of the Principal Representative, the Architect/Engineer and State Buildings Program, the requirements for issuance of a Notice of Substantial Completion can be satisfied with respect to the discrete portion of the Project, a partial Notice of Substantial Completion may be issued for such discrete physical portion of the Project.

SCHEDULE 3 - NOTICE OF ACCEPTANCE

The Notice of Acceptance shall establish the completion date of the Project. It shall not be authorized until the Contractor shall have performed all of the Work to allow completion and approval of the Pre-Acceptance Checklist (SBP-05).

Where partial Notices of Substantial Completion have been issued, partial Notices of Final Acceptance may be similarly issued when appropriate for that portion of the Work. Partial Notice of Final Acceptance may also be issued to exclude the Work described in Change Orders executed during late stages of the Project where a later completion date for the Change Ordered Work is expressly provided for in the Contract as amended by the Change Order, provided the Work can be adequately described to allow partial advertisement of any Notice of Partial Final Settlement to be issued without confusion as to the Work included for which final payment will be made.

SCHEDULE 4 - SETTLEMENT

Final payment and settlement shall be made on the date fixed and published for such payment except as hereafter provided. The Principal Representative shall not authorize final payment until all items on the Pre-Acceptance check list (SBP-05) have been completed, the Notice of Acceptance issued, and the Notice of Contractors Settlement published. If the Work shall be substantially completed, but Final Acceptance and completion thereof shall be prevented through delay in correction of minor defects, or unavailability of materials or other causes beyond the control of the Contractor, the Principal Representative in his or her discretion may release all amounts due to the Contractor except such amounts as may be in excess of three times the cost of completing the unfinished Work or the cost of correcting the defective Work, as estimated by the Architect/Engineer and approved by State Buildings Program. Before the Principal Representative may issue the Notice of Contractor’s Settlement and advertise the Project for final payment, the Contractor shall have corrected all items on the punch list except those items for which delayed performance is expressly permitted, subject to withholding for the cost thereof, and shall have delivered to the Principal Representative:

a)  All guarantees and warranties;

b)  All statements to support local sales tax refunds, if any;

c)  Required operating maintenance instructions as per the Principal Representative; and,

d)  One (1) set of hard copy as-built Contract Documents, and one (1) electronic copy showing all job changes.
e) Demonstrated to the operating personnel of the Principal Representative the proper operation and maintenance of all equipment.

f) A written disclosure of the Five Most Costly Goods incorporated into the project, including iron, steel, or related manufactured goods and the total cost and country of origin of those five goods and whether the project was subject to any existing domestic content preferences.

Upon completion of the foregoing the Project shall be advertised in accordance with the Notice of Contractor’s Settlement by two publications of Notice, the last publication appearing at least ten (10) days prior to the time of final settlement. Publication and final settlement should not be postponed or delayed solely by virtue of unresolved claims against the Project or the Contractor from Subcontractors, suppliers or materialmen based on good faith disputes; the resolution of the question of payment in such cases being directed by statute.

Except as hereafter provided, on the date of final settlement thus advertised, provided the Contractor has submitted a written Notice to the Architect/Engineer that no claims have been filed, and further provided the Principal Representative shall have received no claims, final payments and settlement shall be made in full. If any unpaid claim for labor, materials, rental machinery, tools, supplies or equipment is filed before payment in full of all sums due the Contractor, the Principal Representative and the State Controller shall withhold from the Contractor on the date established for final settlement, sufficient funds to insure the payment of such claim, until the same shall have been paid or withdrawn, such payment or withdrawal to be evidenced by filing a receipt in full or an order for withdrawal signed by the claimant or his or her duly authorized agent or assignee. The amount so withheld may be in the amount of 125% of the claims or such other amount as the Principal Representative reasonably deems necessary to cover expected legal expenses. Such withheld amounts shall be in addition to any amount withheld based on the cost to compete unfinished Work or the cost to repair defective Work. However, as provided by statute, such funds shall not be withheld longer than ninety (90) days following the date fixed for final settlement with the Contractor, as set forth in the published Notice of Contractor’s Settlement, unless an action at law shall be commenced within that time to enforce such unpaid claim and a Notice of such action at law shall have been filed with the Principal Representative and the State Controller. At the expiration of the ninety (90) day period, the Principal Representative shall authorize the State Controller to release to the Contractor all other money not the subject of such action at law or withheld based on the cost to compete unfinished Work or the cost to repair defective Work.

Notices of Partial Final Settlement may be similarly advertised, provided all conditions precedent have been satisfied as though that portion of the Work affected stood alone, a Notice of Partial Acceptance has been issued, and the consent of surety to the partial final settlement has been obtained in writing. Thereafter, partial final payments may be made to the Contractor subject to the same conditions regarding unpaid claims.

PART 45 - ARTICLE 42  GENERAL WARRANTY AND CORRECTION OF WORK AFTER ACCEPTANCE

The Contractor warrants that the materials used and the equipment furnished shall be new and of good quality unless specified to the contrary. The Contractor further warrants that the Work shall, in all respects, be free from material defects not permitted by the Specifications and shall be in accordance with the requirements of the Contract Documents. Neither the final certificate
for payment nor any provision in the Contract Documents shall relieve the Contractor of responsibility for defects or faulty materials or Workmanship. The Contractor shall be responsible to the Principal Representative for such warranties for the longest period permitted by any applicable statute of limitations.

In addition to these general warranties, and without limitation of these general warranties, for a period of one year after the date of any Notice of Substantial Completion, or any Notice of Partial Substantial Completion if applicable, the Contractor shall remedy defects, and faulty Workmanship or materials, and Work not in accordance with the Contract Documents which was not accepted at the time of the Notice of Final Acceptance, all in accordance with the provisions of Article 44, One-Year Guarantee And Special Guarantees And Warranties.

PART 46 - ARTICLE 43 LIENS

Colorado statutes do not provide for any right of lien against public buildings. In lieu thereof, C.R.S. § 38-26-107, provides adequate relief for any claimant having furnished labor, materials, rental machinery, tools, equipment, or services toward construction of the particular public Work in that final payment may not be made to a Contractor until all such creditors have been put on Notice by publication in the public press of such pending payment and given opportunity for a period of up to ninety (90) days to stop payment to the Contractor in the amount of such claims.

PART 47 - ARTICLE 44 ONE-YEAR GUARANTEE AND SPECIAL GUARANTEES AND WARRANTIES

SCHEDULE 0 - ONE-YEAR GUARANTEE OF THE WORK

The Contractor shall guarantee to remedy defects and repair or replace the Work for a period of one year from the date of the Notice of Substantial Completion or from the dates of any partial Notices of Substantial Completion issued for discrete physical portions of the Work. The Contractor shall remedy any defects due to faulty materials or Workmanship and shall pay for, repair and replace any damage to other Work resulting there from, which shall appear within a period of one year from the date of such Notice(s) of Substantial Completion. The Contractor shall also remedy any deviation from the requirements of the Contract Documents which shall later be discovered within a period of one year from the date of the Notice of Substantial Completion; provided, however, that the Contractor shall not be required to remedy deviations from the requirements of the Contract Documents where such deviations were obvious, apparent and accepted by the Architect/Engineer or the Principal Representative at the time of the Notice of Final Acceptance. The Principal Representative shall give Notice of observed defects or other Work requiring correction with reasonable promptness. Such Notice shall be in writing to the Architect/Engineer and the Contractor.

The one year guarantee of the Contractor’s Work may run separately for discrete physical portions of the Work for which partial Notices of Substantial Completion have been issued, however, it shall run from the last Notice of Substantial Completion with respect to all or any systems common to the Work to which more than one Notice of Substantial Completion may apply.
This one-year guarantee shall not be construed to limit the Contractor’s general warranty described in Article 42, General Warranty and Correction of Work After Acceptance, that all materials and equipment are new and of good quality, unless specified to the contrary, and that the Work shall in all respects be free from material defects not permitted by the Specifications and in accordance with the requirements of the Contract Documents.

**SCHEDULE 1 - SPECIAL GUARANTEES AND WARRANTIES**

In case of Work performed for which product, manufacturers or other special warranties are required by the Specifications, the Contractor shall secure the required warranties and deliver copies thereof to the Principal Representative through the Architect/Engineer upon completion of the Work.

These product, manufacturers or other special warranties, as such, do not in any way lessen the Contractor’s responsibilities under the Contract. Whenever guarantees or warranties are required by the Specifications for a longer period than one year, such longer period shall govern.

**PART 48 - ARTICLE 45 GUARANTEE INSPECTIONS AFTER COMPLETION**

The Architect/Engineer, the Principal Representative and the Contractor together shall make at least two (2) complete inspections of the Work after the Work has been determined to be substantially complete and accepted. One such inspection, the “Six-Month Guarantee Inspection,” shall be made approximately six (6) months after date of the Notice of Substantial Completion, unless in the case of smaller projects valued under $500,000 this inspection is declined in Article 7.5 (Contractor’s Agreement SC-6.21), Modification of Article 45, in which case the inspection to occur at six months shall not be required. Another such inspection, the “Eleven-Month Guaranty Inspection” shall be made approximately eleven (11) months after the date of the Notice of Substantial Completion. The Contractor shall schedule and so notify all parties concerned, and the Principal Representative shall so notify State Buildings Program, of these inspections. If more than one Notice of Substantial Completion has been issued at the reasonable discretion of the Principal Representative separate eleven month inspections may be required where the one year guarantees do not run reasonably concurrent.

Written punch lists and reports of these inspections shall be made by the Architect/Engineer and forwarded to the Contractor, the Principal Representative, State Buildings Program, and all other participants within ten (10) days after the completion of the inspections. The punch list shall itemize all guarantee items, prior punch list items still to be corrected or completed and any other requirements of the Contract Documents to be completed which were not waived by final acceptance because they were not obvious or could not reasonably have been previously observed. The Contractor shall immediately initiate such remedial Work as may be necessary to correct any deficiencies or defective Work shown by this report, and shall promptly complete all such remedial Work in a manner satisfactory to the Architect/Engineer, the Principal Representative and State Buildings Program.

If the Contractor fails to promptly correct all deficiencies and defects shown by this report, the Principal Representative may do so, after giving the Contractor ten (10) days written Notice of intention to do so.
The State of Colorado, acting by and through the Principal Representative, shall be entitled to collect from the Contractor all costs and expenses incurred by it in correcting such deficiencies and defects, as well as all damages resulting from such deficiencies and defects.

PART 49 - ARTICLE 46  TIME OF COMPLETION AND LIQUIDATED DAMAGES

It is hereby understood and mutually agreed, by and between the parties hereto, that the date of beginning, rate of progress, and the time for completion of the Work to be done hereunder are ESSENTIAL CONDITIONS of this Agreement, and it is understood and agreed that the Work embraced in this Contract shall be commenced at the time specified in the Notice to Proceed (SC-6.26).

It is further agreed that time is of the essence of each and every portion of this Contract, and of any portion of the Work described on the Drawings or Specifications, wherein a definite and certain length of time is fixed for the performance of any act whatsoever. The parties further agree that where under the Contract additional time is allowed for the completion of the Work or any identified portion of the Work, the new time limit or limits fixed by such extension of the time for completion shall be of the essence of this Agreement.

The Contractor acknowledges that subject to any limitations in the Advertisement for Bids, issued for the Project, the Contractor’s bid is consistent with and considers the number of days to substantially complete the Project and the number of days to finally complete the Project to which the parties may have stipulated in the Agreement, which stipulation was based on the Contractor’s bid. The Contractor agrees that Work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will ensure the Project will be substantially complete, and fully and finally complete, as recognized by the issuance of all required Notices of Substantial Completion and Notices of Final Acceptance, within any times stipulated and specified in the Agreement, as the same may be amended by Change Order or other written modification, and that the Principal Representative will be damaged if the times of completion are delayed.

It is expressly understood and agreed, by and between the parties hereto, that the times for the Substantial Completion of the Work or for the final acceptance of the Work as may be stipulated in the Agreement, and as applied here and in Article 7.6 of the Contractor’s Design/Bid/Build Agreement SC-6.21), Modifications of Article 46, are reasonable times for these stages of completion of the Work, taking into such consideration all factors, including the average climatic range and usual industrial conditions prevailing in the locality of the building operations.

If the Contractor shall neglect, fail or refuse to complete the Work within the times specified in the Agreement, such failure shall constitute a breach of the terms of the Contract and the State of Colorado, acting by and through the Principal Representative, shall be entitled to liquidated damages for such neglect, failure or refusal, as specified in Article 7.6 of the Contractor’s Design/Bid/Build Agreement SC-6.21, Modification of Article 46.

The Contractor and the Contractor’s Surety shall be jointly liable for and shall pay the Principal Representative, or the Principal Representative may withhold, the sums hereinafter stipulated as liquidated damages for each calendar day of delay until the entire Project is 1) substantially completed, and the Notice (or all Notices) of Substantial Completion are issued, 2) finally complete and accepted and the Notice (or all Notices) of Acceptance are issued, or 3) both. Delay
in substantial completion shall be measured from the Date of the Notice to Proceed and delay in final completion and acceptance shall be measured from the Date of the Notice of Substantial Completion.

In the first instance, specified in Article 7.6.1 of the Contractor’s Design/Bid/Build Agreement SC-6.21, Modification of Article 46, liquidated damages, if any, shall be the amount specified therein, for each calendar day of delay beginning after the stipulated number of days for Substantial Completion from the date of the Notice to Proceed, until the date of the Notice of Substantial Completion. Unless otherwise specified in any Supplementary General Conditions, in the event of any partial Notice of Substantial Completion, liquidated damages shall accrue until all required Notices of Substantial Completion are issued.

In the second instance, specified in Article 7.6.2 of the Contractor’s Design/Bid/Build Agreement SC-6.21, Modification of Article 46, liquidated damages, if any, shall be the amount specified in Article 7.6.2 of the Contractor’s Design/Bid/Build Agreement SC-6.21, Modification of Article 46, for each calendar day in excess of the number of calendar days specified in the Contractor’s bid for the Project and stipulated in the Agreement to finally complete the Project (as defined by the issuance of the Notice of Acceptance) after the final Notice of Substantial Completion has been issued.

In the third instance, when so specified in both Articles 7.6.1 and 7.6.2 of the Contractor’s Agreement SC-6.21, both types of liquidated damages shall be separately assessed where those delays have occurred.

The parties expressly agree that said amounts are a reasonable estimate of the presumed actual damages that would result from any of the breaches listed, and that any liquidated damages that are assessed have been agreed to in light of the difficulty of ascertaining the actual damages that would be caused by any of these breaches at the time this Contract was formed; the liquidated damages in the first instance representing an estimate of damages due to the inability to use the Project; the liquidated damages in the second instance representing an estimate of damages due to the additional administrative, technical, supervisory and professional expenses related to and arising from the extended closeout period including delivery of any or all guarantees and warranties, the submittals of sales and use tax payment forms, the calling for the final inspection and the completion of the final punch list.

The parties also agree and understand that the liquidated damages to be assessed in each instance are separate and distinct, although potentially cumulative, damages for the separate and distinct breaches of delayed substantial completion or final acceptance. Such liquidated damages shall not be avoided by virtue of the fact of concurrent delay caused by the Principal Representative, or anyone acting on behalf of the Principal Representative, but in such event the period of delay for which liquidated damages are assessed shall be equitably adjusted in accordance with Article 38, Delays and Extensions of Time.

PART 50 - ARTICLE 47   DAMAGES

If either party to this Contract shall suffer damage under this Contract in any manner because of any wrongful act or neglect of the other party or of anyone employed by either of them, then the party suffering damage shall be reimbursed by the other party for such damage. Except to the
extent of damages liquidated for the Contractor’s failure to achieve timely completion as set forth in Article 46, Time of Completion and Liquidated Damages, the Principal Representative shall be responsible for, and at his or her option may insure against, loss of use of any existing property not included in the Work, due to fire or otherwise, however caused. Notwithstanding the foregoing, or any other provision of this Contract, to the contrary, no term or condition of this contract shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protection, or other provisions of the Colorado Governmental Immunity Act, Section 24-10-101, et seq., CRS, as now or hereafter amended. The parties understand and agree that liability for claims for injuries to persons arising out of negligence of the State of Colorado, its departments, institutions, agencies, boards, officials and employees is controlled and limited by the provisions of Section 24-101-101, et seq., CRS, as now or hereafter amended and the risk management statutes, Section 24-30-1501, et seq., CRS, as now or hereafter amended.

Notice of intent to file a claim under this clause shall be made in writing to the party liable within a reasonable time of the first observance of such damage and not later than the time of final payment, except that in the case of claims by the Principal Representative involving warranties against faulty Work or materials Notice shall be required only to the extent stipulated elsewhere in these General Conditions. Claims made to the Principal Representative involving extra cost or extra time arising by virtue of instructions to the Contractor to which Article 36, Claims, applies shall be made in accordance with Article 36. Other claims arising under the Contract involving extra cost or extra time which are made to the Principal Representative under this clause shall also be made in accordance with the procedures of Article 36, whether or not arising by virtue of instructions to the Contractor; provided however that it shall not be necessary to first obtain or request a written judgment of the Architect/Engineer.

Provided written Notice of intent to file a claim is provided as required in the preceding paragraph, nothing in this Article shall limit or restrict the rights of either party to bring an action at law or to seek other relief to which either party may be entitled, including consequential damages, if any, and shall not be construed to limit the time during which any action might be brought. Nothing in these General Conditions shall be deemed to limit the period of time during which any action may be brought as a matter of contract, tort, warranty or otherwise, it being the intent of the parties to allow any and all actions at law or in equity for such periods as the law permits. All such rights shall, however be subject to the obligation to assert claims and to appeal denials pursuant to Article 36, Claims, where applicable.

PART 51 - ARTICLE 48 STATE’S RIGHT TO DO THE WORK; TEMPORARY SUSPENSION OF WORK; DELAY DAMAGES

SCHEDULE 0 - STATE’S RIGHT TO DO THE WORK

If after receipt of Notice to do so, the Contractor should neglect to prosecute the Work properly or fail to perform any provision of the Contract, the Principal Representative, after a second seven (7) days’ advance written Notice to the Contractor and the Surety may, without prejudice to any other remedy the Principal Representative may have, take control of all or a portion of the Work, as the Principal Representative deems necessary and make good such deficiencies deducting the cost thereof from the payment then or thereafter due the Contractor, as provided in Article 30,
Correction Of Work Before Acceptance and Article 33, Payments Withheld, provided, however, that the Architect/Engineer shall approve the amount charged to the Contractor by approval of the Change Order.

SCHEDULE 1 - TEMPORARY SUSPENSION OF WORK

The State, acting for itself or by and through the Architect/Engineer, shall have the authority to suspend the Work, either wholly or in part, for such period or periods as may be deemed necessary due to:

a) Unsuitable weather;
b) Faulty Workmanship;
c) Improper superintendence or project management;
d) Contractor’s failure to carry out orders or to perform any provision of the Contract Documents;
e) Loss of, or restrictions to, appropriations;
f) Conditions, which may be considered unfavorable for the prosecution of the Work.

If it should become necessary to stop Work for an indefinite period, the Contractor shall store materials in such manner that they will not become an obstruction or become damaged in any way; and he or she shall take every precaution to prevent damage to or deterioration of the Work, provide suitable drainage and erect temporary structures where necessary.

Notice of suspension of Work shall be provided to the Contractor in writing stating the reasons therefore. The Contractor shall again proceed with the Work when so notified in writing.

The Contractor understands and agrees that the State of Colorado cannot predict with certainty future revenues and could ultimately lack the revenue to fund the appropriations applicable to this Contract. The Contractor further acknowledges and agrees that in such event that State may, upon Notice to the Contractor, suspend the Work in anticipation of a termination of the Contract for the convenience of the State, pursuant to Article 50, Termination for Convenience of State. If the Contract is not so terminated the Contract sum and the Contract time shall be equitably adjusted at the time the Principal Representative directs the Work to be recommenced and gives Notice that the revenue to fund the appropriation is available.

SCHEDULE 2 - DELAY DAMAGES

The Principal Representative and the State of Colorado shall be liable to the Contractor for the payment of any claim for extra costs, extra compensation or damages occasioned by hindrances or delays encountered in the Work only when and to the limited extent that such hindrance or delay is caused by an act or omission within the control of the Principal Representative, the Architect/Engineer or other persons or entities acting on behalf of the Principal Representative. Further, the Principal Representative and the State of Colorado shall be liable to the Contractor for the payment of such a claim only if the Contractor has provided required Notice of the delay or impact, or has presented its claim for an extension of time or claim of other delay or other impact due to changes ordered in the Work before proceeding with the changed Work. Except as otherwise provided, claims for extension of time shall be Noticed and filed in accordance with Article 38, Delays and Extensions of Time, within three (3) business days of the beginning of the
delay with any claim filed within seven (7) days after the delay has ceased, or such claim is waived. 
Claims for extension of time or for other delay or other impact resulting from changes ordered in
the Work shall be presented and adjusted as provided in Article 35, Changes in the Work.

PART 52 - ARTICLE 49  STATE’S RIGHTS TO TERMINATE CONTRACT

SCHEDULE 0 - GENERAL

If the Contractor should be adjudged bankrupt, or if he or she should make a general assignment
for the benefit of his or her creditors, or if a receiver should be appointed to take over his or her
affairs, or if he or she should fail to prosecute his or her Work with due diligence and carry the
Work forward in accordance with the construction schedule and the time limits set forth in the
Contract Documents, or if he or she should fail to subsequently perform one or more of the
provisions of the Contract Documents to be performed by him or her, the Principal Representative
may serve written Notice on the Contractor and the Surety on performance and payment bonds,
stating his or her intention to exercise one of the remedies hereinafter set forth and the grounds
upon which the Principal Representative bases his or her right to exercise such remedy.

In such event, unless the matter complained of is satisfactorily cleared within ten (10) days after
delivery of such Notice, the Principal Representative may, without prejudice to any other right or
remedy, exercise one of such remedies at once, having first obtained the concurrence of the
Architect/Engineer in writing that sufficient cause exists to justify such action.

SCHEDULE 1 - CONDITIONS AND PROCEDURES

PRODUCT DATA SHEET 0 - Termination

The Principal Representative may terminate the services of the Contractor, which termination
shall take effect immediately upon service of Notice thereof on the Contractor and his or her
Surety, whereupon the Surety shall have the right to take over and perform the Contract. If the
Surety does not provide Notice to the Principal Representative of its intent to commence
performance of the Contract within ten (10) days after delivery of the Notice of termination, the
Principal Representative may take over the Work, take possession of and use all materials, tools,
equipment and appliances on the premises and prosecute the Work to completion by such means
as he or she shall deem best. In the event of such termination of his or her service, the Contractor
shall not be entitled to any further payment under the Contract until the Work is completed and
accepted. If the Principal Representative takes over the Work and if the unpaid balance of the
contract price exceeds the cost of completing the Work, including compensation for any damages
or expenses incurred by the Principal Representative through the default of the Contractor, such
excess shall be paid to the Contractor. If, however, the cost, expenses and damages as certified
by the Architect/Engineer exceed such unpaid balance of the contract price, the Contractor and
his or her Surety shall pay the difference to the Principal Representative.

PRODUCT DATA SHEET 1 - Use of Surety

The Principal Representative may require the Surety on the Contractor’s bond to take control of
the Work and see to it that all the deficiencies of the Contractor are made good, with due diligence
within ten (10) days of delivery of Notice to the Surety to do so. As between the Principal
Representative and the Surety, the cost of making good such deficiencies shall all be borne by the
Surety. If the Surety takes over the Work, either by election upon termination of the services of the Contractor pursuant to Section 49.2.1 of this Article 49, State's Right To Terminate Contract, or upon instructions from the Principal Representative to do so, the provisions of the Contract Documents shall govern the Work to be done by the Surety, the Surety being substituted for the Contractor as to such provisions, including provisions as to payment for the Work, the times of completion and provisions of this Article as to the right of the Principal Representative to do the Work or to take control of all or a portion of the Work.

PRODUCT DATA SHEET 2 - Correcting Deficiencies

The Principal Representative may take control of all or a portion of the Work and make good the deficiencies of the Contractor, or the Surety if the Surety has been substituted for the Contractor, with or without terminating the Contract, employing such additional help as the Principal Representative deems advisable in accordance with the provisions of Article 48.1, State's Right to Do the Work; Temporary Suspension of Work; Delay Damages. In such event, the Principal Representative shall be entitled to collect from the Contractor and his or her Surety, or to deduct from any payment then or thereafter due the Contractor, the costs incurred in having such deficiencies made good and any damages or expenses incurred through the default of Contractor, provided the Architect/Engineer approves the amount thus charged to the Contractor.

If the Contract is not terminated, a Change Order to the Contract shall be executed, unilaterally if necessary, in accordance with the procedures of Article 35, Changes In The Work.

SCHEDULE 2 - ADDITIONAL CONDITIONS

If any termination by the Principal Representative for cause is later determined to have been improper, the termination shall be automatically converted to and deemed to be a termination by the Principal Representative for convenience and the Contractor shall be limited in recovery to the compensation provided for in Article 50, Termination for Convenience of State. Termination by the Contractor shall not be subject to such conversion.

PART 53 - ARTICLE 50 TERMINATION FOR CONVENIENCE OF STATE

SCHEDULE 0 - NOTICE OF TERMINATION

The performance of Work under this Contract may be terminated, in whole or from time to time in part, by the State whenever for any reason the Principal Representative shall determine that such termination is in the best interest of State. Termination of Work hereunder shall be effected by delivery to the Contractor of a Notice of such termination specifying the extent to which the performance of Work under the Contract is terminated and the date upon which such termination becomes effective.

SCHEDULE 1 - PROCEDURES

After receipt of the Notice of termination, the Contractor shall, to the extent appropriate to the termination, cancel outstanding commitments hereunder covering the procurement of materials, supplies, equipment and miscellaneous items. In addition, the Contractor shall exercise all
reasonable diligence to accomplish the cancellation or diversion of all applicable outstanding commitments covering personal performance of any Work terminated by the Notice. With respect to such canceled commitments, the Contractor agrees to:

\[\text{g)}\] Settle all outstanding liabilities and all claims arising out of such cancellation of commitments, with approval or ratification of the Principal Representative, to the extent he or she may require, which approval or ratification shall be final for all purposes of this clause; and,

\[\text{h)}\] Assign to the State, in the manner, at the time, and to the extent directed by the Principal Representative, all of the right, title, and interest of the Contractor under the orders and subcontracts so terminated, in which case the State shall have the right, in its discretion, to settle or pay any or all claims arising out of the termination of such orders and subcontracts.

The Contractor shall submit his or her termination claim to the Principal Representative promptly after receipt of a Notice of termination, but in no event later than three (3) months from the effective date thereof, unless one or more extensions in writing are granted by the Principal Representative upon written request of the Contractor within such three-month period or authorized extension thereof. Upon failure of the Contractor to submit his or her termination claim within the time allowed, the Principal Representative may determine, on the basis of information available to him, the amount, if any, due to the Contractor by reason of the termination and shall thereupon pay to the Contractor the amount so determined.

Costs claimed, agreed to, or determined pursuant to the preceding and following paragraph shall be in accordance with the provisions of the Colorado Procurement Code or the applicable procurement code for institutions of higher education.

Subject to the preceding provisions, the Contractor and the Principal Representative may agree upon the whole or any part of the amount or amounts to be paid to the Contractor by reason of the termination under this clause, which amount or amounts may include any reasonable cancellation charges thereby incurred by the Contractor and any reasonable loss upon outstanding commitments for personal services which he or she is unable to cancel; provided, however, that in connection with any outstanding commitments for personal services which the Contractor is unable to cancel, the Contractor shall have exercised reasonable diligence to divert such commitments to other activities and operations. Any such agreement shall be embodied in an Amendment to this Contract and the Contractor shall be paid the agreed amount.

The State may from time to time, under such terms and conditions as it may prescribe, make partial payments against costs incurred by the Contractor in connection with the termination portion of this Contract, whenever, in the opinion of the Principal Representative, the aggregate of such payments is within the amount to which the Contractor will be entitled hereunder.

The Contractor agrees to transfer title and deliver to the State, in the manner, at the time, and to the extent, if any, directed by the Principal Representative, such information and items which, if the Contract had been completed, would have been required to be furnished to the State, including:

\[\text{a)}\] Completed or partially completed plans, Drawings and information; and,

\[\text{b)}\] Materials or equipment produced or in process or acquired in connection with the performance of the Work terminated by the Notice.
Other than the above, any termination inventory resulting from the termination of the Contract may, with written approval of the Principal Representative, be sold or acquired by the Contractor under the conditions prescribed by and at a price or prices approved by the Principal Representative. The proceeds of any such disposition shall be applied in reduction of any payments to be made by the State to the Contractor under this Contract or shall otherwise be credited to the price or cost of Work covered by this Contract or paid in such other manners as the Principal Representative may direct. Pending final disposition of property arising from the termination, the Contractor agrees to take such action as may be necessary, or as the Principal Representative may direct, for the protection and preservation of the property related to this Contract which is in the possession of the Contractor and in which the State has or may acquire an interest.

Any disputes as to questions of fact, which may arise hereunder, shall be subject to the Remedies provisions of the Colorado Procurement Code or the applicable procurement code for institutions of higher education.

PART 54 - ARTICLE 51 CONTRACTOR’S RIGHT TO STOP WORK AND/OR TERMINATE CONTRACT

If the Work shall be stopped under an order of any court or other public authority for a period of three (3) months through no act or fault of the Contractor or of any one employed by him, then the Contractor may on seven (7) days’ written Notice to the Principal Representative and the Architect/Engineer stop Work or terminate this Contract and recover from the Principal Representative payment for all Work executed, any losses sustained on any plant or material, and a reasonable profit only for the Work completed. If the Architect/Engineer shall fail to issue or otherwise act in writing upon any certificate for payment within ten (10) days after it is presented and received by the Architect/Engineer, as provided in Article 31, Applications For Payments, or if the Principal Representative shall fail to pay the Contractor any sum certified that is not disputed in whole or in part by the Principal Representative in writing to the Contractor and the Architect/Engineer within thirty (30) days after the Architect/Engineer’s certification, then the Contractor may on ten (10) days’ written Notice to the Principal Representative and the Architect/Engineer stop Work and/or give written Notice of intention to terminate this Contract.

If the Principal Representative shall thereafter fail to pay the Contractor any amount certified by the Architect/Engineer and not disputed in writing by the Principal Representative within ten (10) days after receipt of such Notice, then the Contractor may terminate this Contract and recover from the Principal Representative payment for all Work executed, any losses sustained upon any plant or materials, and a reasonable profit only for the Work completed. The Principal Representative’s right to dispute an amount certified by the Architect/Engineer shall not relieve the Principal Representative of the obligation to pay amounts not in dispute as certified by the Architect/Engineer.

PART 55 - ARTICLE 52 SPECIAL PROVISIONS

SCHEDULE 0 - CONTROLLER’S APPROVAL, C.R.S. § 24-30-202(1)

This contract shall not be valid until it has been approved by the Colorado State Controller or designee.
SCHEDULE 1 - FUND AVAILABILITY, C.R.S. § 24-30-202(5.5)
Financial obligations of the State payable after the current fiscal year are contingent upon funds for that purpose being appropriated, budgeted, and otherwise made available.

SCHEDULE 2 - GOVERNMENTAL IMMUNITY
Liability for claims for injuries to persons or property arising from the negligence of the State, its departments, boards, commissions committees, bureaus, offices, employees and officials shall be controlled and limited by the provisions of the Colorado Governmental Immunity Act, §24-10-101, et seq., C.R.S.; the Federal Tort Claims Act, 28 U.S.C. Pt. VI, Ch. 171 and 28 U.S.C. 1346(b), and the State’s risk management statutes, §§24-30-1501, et seq. C.R.S. No term or condition of this Contract shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protections, or other provisions, contained in these statutes.

SCHEDULE 3 - INDEPENDENT CONTRACTOR
Contractor shall perform its duties hereunder as an independent Contractor and not as an employee. Neither Contractor nor any agent or employee of Contractor shall be deemed to be an agent or employee of the State. Contractor shall not have authorization, express or implied, to bind the State to any agreement, liability or understanding, except as expressly set forth herein. Contractor and its employees and agents are not entitled to unemployment insurance or workers compensation benefits through the State and the State shall not pay for or otherwise provide such coverage for Contractor or any of its agents or employees. Contractor shall pay when due all applicable employment taxes and income taxes and local head taxes incurred pursuant to this Contract. Contractor shall (i) provide and keep in force workers’ compensation and unemployment compensation insurance in the amounts required by law, (ii) provide proof thereof when requested by the State, and (iii) be solely responsible for its acts and those of its employees and agents.

SCHEDULE 4 - COMPLIANCE WITH LAW
Contractor shall comply with all applicable federal and State laws, rules, and regulations in effect or hereafter established, including, without limitation, laws applicable to discrimination and unfair employment practices.

SCHEDULE 5 - CHOICE OF LAW, JURISDICTION, AND VENUE
Colorado law, and rules and regulations issued pursuant thereto, shall be applied in the interpretation, execution, and enforcement of this Contract. Any provision included or incorporated herein by reference which conflicts with said laws, rules, and regulations shall be null and void. All suits or actions related to this Contract shall be filed and proceedings held in the State of Colorado and exclusive venue shall be in the City and County of Denver.

SCHEDULE 6 - PROHIBITED TERMS
Any term included in this Contract that requires the State to indemnify or hold Contractor harmless; requires the State to agree to binding arbitration; limits Contractor’s liability for damages resulting from death, bodily injury, or damage to tangible property; or that conflicts with this provision in any way shall be void ab initio. Nothing in this Contract shall be construed as a waiver of any provision of §24-106-109, C.R.S.

SCHEDULE 7 - SOFTWARE PIRACY PROHIBITION. SOFTWARE PIRACY PROHIBITION
State or other public funds payable under this Contract shall not be used for the acquisition, operation, or maintenance of computer software in violation of federal copyright laws or applicable licensing restrictions. Contractor hereby certifies and warrants that, during the term of
this Contract and any extensions, Contractor has and shall maintain in place appropriate systems and controls to prevent such improper use of public funds. If the State determines that Contractor is in violation of this provision, the State may exercise any remedy available at law or in equity or under this Contract, including, without limitation, immediate termination of this Contract and any remedy consistent with federal copyright laws or applicable licensing restrictions.

SCHEDULE 8 - EMPLOYEE FINANCIAL INTEREST/CONFLICT OF INTEREST
C.R.S. § 24-18-201 and C.R.S. § 24-50-507
The signatories aver that to their knowledge, no employee of the State has any personal or beneficial interest whatsoever in the service or property described in this contract. Contractor has no interest and shall not acquire any interest, direct or indirect, that would conflict in any manner or degree with the performance of Contractor services and Contractor shall not employ any person having such known interests.

SCHEDULE 9 - VENDOR OFFSET AND ERRONEOUS PAYMENTS
C.R.S. § 24-30-202(1) & C.R.S. § 24-30-202.4
Subject to §24-30-202.4(3.5), C.R.S., the State Controller may withhold payment under the State’s vendor offset intercept system for debts owed to State agencies for: (i) unpaid child support debts or child support arrearages; (ii) unpaid balances of tax, accrued interest, or other charges specified in §§39-21-101, et seq., C.R.S.; (iii) unpaid loans due to the Student Loan Division of the Department of Higher Education; (iv) amounts required to be paid to the Unemployment Compensation Fund; and (v) other unpaid debts owing to the State as a result of final agency determination or judicial action. The State may also recover, at the State’s discretion, payments made to Contractor in error for any reason, including, but not limited to, overpayments or improper payments, and unexpended or excess funds received by Contractor by deduction from subsequent payments under this Contract, deduction from any payment due under any other contracts, grants or agreements between the State and Contractor, or by any other appropriate method for collecting debts owed to the State.

PART 56 - ARTICLE 53 MISCELLANEOUS PROVISIONS

SCHEDULE 0 - PROFESSIONAL ASSOCIATION PERMITTED
The Contractor may, with the prior written consent of the Principal Representative, join with him or her in the performance of this Agreement any other duly licensed Architect or Architects or registered Engineers with whom he or she may, in good faith, and enter into an association.

SCHEDULE 1 - DISSOLUTION OF PROFESSIONAL ASSOCIATION
In the event there is dissolution of the association, other than by death of a member, the State of Colorado, acting by and through the Principal Representative, shall designate which former member shall continue with the work and may make all payments thereafter falling due in connection with the work directly to the person or persons so designated and without being required to look to the application of such payments as among the former members.
SCHEDULE 2 - WAGE RATES, in accordance with C.R.S. § 24-30-1404 (1)

As amended, the Contractor has executed a schedule, which is attached hereto and made a part hereof by reference in Exhibit A, Wage Rates Schedule, and by doing so is certifying that wage rates and other factual unit costs supporting the compensation paid by the State for these professional services are accurate, complete and current. The original contract price and any additions thereto shall be adjusted to exclude any significant sums by which the Principal Representative determines the contract price had been increased due to inaccurate, incomplete, or non-current wage rates and other factual unit costs. All such contract adjustments shall be made within one year following the end of this contract.

SCHEDULE 3 - PUBLIC ART LAW

In recognition of the Public Art Law, C.R.S. § 24-48.5-312, as amended, if the State determines that this project is eligible for the acquisition of artworks in accordance with this law, the Contractor agrees to participate in the art selection process as an art jury member and to cooperate with and to advise the State in working with the commissioned artist(s) for this Capital Construction Project.

SCHEDULE 4 - ASSIGNMENT

Contractor’s rights and obligations under this Contract are personal and may not be transferred or assigned without the prior, written consent of the State. Any attempt at assignment or transfer without such consent shall be void. Any assignment or transfer of Contractor’s rights and obligations approved by the State shall be subject to the provisions of this Contract.

SCHEDULE 5 - SUBCONTRACTS

Contractor shall not enter into any subcontract in connection with its obligations under this Contract without the prior, written approval of the State. Contractor shall submit to the State a copy of each such subcontract upon request by the State. All subcontracts entered into by Contractor in connection with this Contract shall comply with all applicable federal and state laws and regulations, shall provide that they are governed by the laws of the State of Colorado, and shall be subject to all provisions of this Contract.

SCHEDULE 6 - BINDING EFFECT

Except as otherwise provided in §17.A, all provisions of this Contract, including the benefits and burdens, shall extend to and be binding upon the Parties’ respective successors and assigns.

SCHEDULE 7 - AUTHORITY

Each Party represents and warrants to the other that the execution and delivery of this Contract and the performance of such Party’s obligations have been duly authorized.

SCHEDULE 8 - CAPTIONS AND REFERENCES

The captions and headings in this Contract are for convenience of reference only, and shall not be used to interpret, define, or limit its provisions. All references in this Contract to sections (whether spelled out or using the § symbol), subsections, exhibits or other attachments, are references to sections, subsections, exhibits or other attachments contained herein or incorporated as a part hereof, unless otherwise noted.
SCHEDULE 9 - COUNTERPARTS
This Contract may be executed in multiple, identical, original counterparts, each of which shall be
deemed to be an original, but all of which, taken together, shall constitute one and the same
agreement.

SCHEDULE 10 - ENTIRE UNDERSTANDING
This Contract represents the complete integration of all understandings between the Parties
related to the Work, and all prior representations and understandings related to the Work, oral
or written, are merged into this Contract. Prior or contemporaneous additions, deletions, or other
changes to this Contract shall not have any force or effect whatsoever, unless embodied herein.

SCHEDULE 11 - DIGITAL SIGNATURES
If any signatory signs this Contract using a digital signature in accordance with the Colorado State
Controller Contract, Grant and Purchase Order Policies regarding the use of digital signatures
issued under the State Fiscal Rules, then any agreement or consent to use digital signatures within
the electronic system through which that signatory signed shall be incorporated into this Contract
by reference.

SCHEDULE 12 - MODIFICATION
Except as otherwise provided in this Contract, any modification to this Contract shall only be
effective if agreed to in a formal amendment to this Contract, properly executed and approved in
accordance with applicable Colorado State law and State Fiscal Rules. Modifications permitted
under this Contract, other than contract amendments, shall conform to the policies issued by the
Colorado State Controller.

SCHEDULE 13 - STATUTES, REGULATIONS, FISCAL RULES AND OTHER AUTHORITY
Any reference in this Contract to a statute, regulation, State Fiscal Rule, fiscal policy or other
authority shall be interpreted to refer to such authority then current, as may have been changed
or amended since the Effective Date of this Contract.

SCHEDULE 14 - EXTERNAL TERMS AND CONDITIONS
Notwithstanding anything to the contrary herein, the State shall not be subject to any provision
included in any terms, conditions, or agreements appearing on Contractor’s or a Subcontractor’s
website or any provision incorporated into any click-through or online agreements related to the
Work unless that provision is specifically referenced in this Contract.

SCHEDULE 15 - SEVERABILITY
The invalidity or unenforceability of any provision of this Contract shall not affect the validity or
enforceability of any other provision of this Contract, which shall remain in full force and effect,
provided that the Parties can continue to perform their obligations under this Contract in
accordance with the intent of this Contract.

SCHEDULE 16 - SURVIVAL AND CERTAIN CONTRACT TERMS
Any provision of this Contract that imposes an obligation on a Party after termination or expiration
of this Contract shall survive the termination or expiration of this Contract and shall be
enforceable by the other Party.

SCHEDULE 17 - TAXES
The State is exempt from federal excise taxes under I.R.C. Chapter 32 (26 U.S.C., Subtitle D, Ch.
32) (Federal Excise Tax Exemption Certificate of Registry No. 84-730123K) and from State and local
government sales and use taxes under §§39-26-704(1), et seq., C.R.S. (Colorado Sales Tax Exemption Identification Number 98-02565). The State shall not be liable for the payment of any excise, sales, or use taxes, regardless of whether any political subdivision of the state imposes such taxes on Contractor. Contractor shall be solely responsible for any exemptions from the collection of excise, sales or use taxes that Contractor may wish to have in place in connection with this Contract.

SCHEDULE 18 - THIRD PARTY BENEFICIARIES
Except for the Parties’ respective successors and assigns described in § 17.A, this Contract does not and is not intended to confer any rights or remedies upon any person or entity other than the Parties. Enforcement of this Contract and all rights and obligations hereunder are reserved solely to the Parties. Any services or benefits which third parties receive as a result of this Contract are incidental to this Contract, and do not create any rights for such third parties.

SCHEDULE 19 - WAIVER
A Party’s failure or delay in exercising any right, power, or privilege under this Contract, whether explicit or by lack of enforcement, shall not operate as a waiver, nor shall any single or partial exercise of any right, power, or privilege preclude any other or further exercise of such right, power, or privilege.

SCHEDULE 20 - CORA DISCLOSURE
To the extent not prohibited by federal law, this Contract and the performance measures and standards required under §24-106-107, C.R.S., if any, are subject to public release through the CORA.

SCHEDULE 21 - STANDARD AND MANNER OF PERFORMANCE
Contractor shall perform its obligations under this Contract in accordance with the highest standards of care, skill and diligence in Contractor’s industry, trade, or profession.

SCHEDULE 22 - LICENSES, PERMITS, AND OTHER AUTHORIZATIONS
Contractor shall secure, prior to the Effective Date, and maintain at all times during the term of this Contract, at its sole expense, all licenses, certifications, permits, and other authorizations required to perform its obligations under this Contract, and shall ensure that all employees, agents and Subcontractors secure and maintain at all times during the term of their employment, agency or subcontract, all license, certifications, permits and other authorizations required to perform their obligations in relation to this Contract.

SCHEDULE 23 - INDEMNIFICATION

PRODUCT DATA SHEET 0 - General Indemnification
Contractor shall indemnify, save, and hold harmless the State, its employees, agents and assignees (the “Indemnified Parties”), against any and all costs, expenses, claims, damages, liabilities, court awards and other amounts (including attorneys’ fees and related costs) incurred by any of the Indemnified Parties in relation to any act or omission by Contractor, or its employees, agents, Subcontractors, or assignees in connection with this Contract.

PRODUCT DATA SHEET 1 - Confidential Information Indemnification
Disclosure or use of State Confidential Information by Contractor in violation of §8 may be cause for legal action by third parties against Contractor, the State, or their respective agents.
Contractor shall indemnify, save, and hold harmless the Indemnified Parties, against any and all claims, damages, liabilities, losses, costs, expenses (including attorneys’ fees and costs) incurred by the State in relation to any act or omission by Contractor, or its employees, agents, assigns, or Subcontractors in violation of §8.

PRODUCT DATA SHEET 2 - Intellectual Property Indemnification

Contractor shall indemnify, save, and hold harmless the Indemnified Parties, against any and all costs, expenses, claims, damages, liabilities, and other amounts (including attorneys’ fees and costs) incurred by the Indemnified Parties in relation to any claim that any Deliverable, Good or Service, software, or Work Product provided by Contractor under this Contract (collectively, “IP Deliverables”), or the use thereof, infringes a patent, copyright, trademark, trade secret, or any other intellectual property right. Contractor’s obligations hereunder shall not extend to the combination of any IP Deliverables provided by Contractor with any other product, system, or method, unless the other product, system, or method is (a) provided by Contractor or Contractor’s subsidiaries or affiliates; (b) specified by Contractor to work with the IP Deliverables; (c) reasonably required in order to use the IP Deliverables in its intended manner and the infringement could not have been avoided by substituting another reasonably available product, system, or method capable of performing the same function; or (d) is reasonably expected to be used in combination with the IP Deliverables.

PRODUCT DATA SHEET 3 - Accessibility Indemnification

Contractor shall indemnify, save, and hold harmless the state, its employees, agents and assignees (collectively, the “Indemnified Parties”), against any and all costs, expenses, claims, damages, liabilities, court awards and other amounts (including attorneys’ fees and related costs) incurred by any of the Indemnified Parties in relation to Contractor’s failure to comply with §§24-85-101, et seq., C.R.S., or the Accessibility Standards for Individuals with a Disability as established by the Office of Information Technology pursuant to Section §24-85-103 (2.5), C.R.S.

SCHEDULE 24 - ACCESSIBILITY

Contractor shall comply with and the Work Product provided under this Contract shall be in compliance with all applicable provisions of §§24-85-101, et seq., C.R.S., and the Accessibility Standards for Individuals with a Disability, as established by the Governor’s Office Of Information Technology (OIT), pursuant to Section §24-85-103 (2.5), C.R.S. Contractor shall also comply with all State of Colorado technology standards related to technology accessibility and with Level AA of the most current version of the Web Content Accessibility Guidelines (WCAG), incorporated in the State of Colorado technology standards.

PRODUCT DATA SHEET 0 - The State may require Contractor’s compliance to the State’s Accessibility Standards to be determined by a third party selected by the State to attest to Contractor’s Work Product and software is in compliance with §§24-85-101, et seq., C.R.S., and the Accessibility Standards for Individuals with a Disability as established by the Office of Information Technology pursuant to Section §24-85-103 (2.5), C.R.S.
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT M: SUPPLEMENTARY GENERAL CONDITIONS: FEDERAL PROVISIONS

IF APPLICATBLE TO THIS PROJECT, THE FOLLOWING EXHIBITS SHALL BE INCLUDED.

Supplementary General Conditions Federal Provisions

SLFRF Federal Funds: Contractor Terms and Conditions Certification

SLFRF Federal Funds: Contractor Terms and Conditions
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT S: UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS SUPPLEMENTARY
GENERAL CONDITIONS

Ex S
The Agreement shall be amended as follows:

1. The terms University, University of Colorado, University of Colorado Denver, University of Colorado Anschutz Medical Campus, CU Denver, CU Anschutz, CU, and Principal Representative, are interchangeable.

2. For purposes of this supplement, “Contractor” as used herein shall mean, as appropriate to the State Contract form being used, Contractor, Standing Order Contractor, Construction Manager/General Contractor, or Design/Build Entity.

3. **Replace Article 25 as follows:**

**ARTICLE 25. INSURANCE**

**COVERAGE AND LIMITS OF INSURANCE**
Contractor shall provide coverage with limits of liability not less than those stated below.

A **General**

The Contractor shall obtain and maintain, at its own expense and for the duration of the contract including any warranty periods under the Contract are satisfied, the insurance coverages set forth below.

By requiring such insurance, the Principal Representative shall not be deemed or construed to have assessed the risk that may be applicable to the Contractor its agents, representatives, employees or subcontractors under this contract. The insurance requirements herein for this Contract in no way limit the indemnity covenants contained in the Contract. The Principal Representative in no way warrants that the limits contained herein are sufficient to protect the Contractor from liabilities that might arise out of the performance of the work under this Contract by the Contractor, its agents, representatives, employees, or subcontractors. The Contractor shall assess its own risks and if it deems appropriate and/or prudent, maintain higher limits and/or broader coverages. The Contractor is not relieved of any liability or other obligations assumed or pursuant to the Contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration, or types.

B **Commercial General Liability – ISO CG 0001 or equivalent. Coverage to include:**

1. Premises and Operations
2. Explosions, Collapse and Underground Hazards
3. Personal / Advertising Injury
4. Products / Completed Operations
5. Liability assumed under an Insured Contract (including defense costs assumed under contract)
6. Independent Contractors
10. The policy shall be endorsed to include the following additional insured language on the Additional Insured Endorsements specified above: “The Regents of the University of Colorado, a Body Corporate, named as an additional insured with respect to liability and defense of suits arising out of the activities performed by, or on behalf of the Contractor, including completed operations”.

11. Commercial General Liability Completed Operations policies must be kept in effect for up to three (3) years after completion of the project. For buildings with a construction cost greater than $99 million, the Commercial General Liability Completed Operations policies must be kept in effect for up to eight (8) years after the completion of the project.

12. An umbrella and/or excess liability policy may be used to meet the minimum liability requirements provided that the coverage is written on a “following form” basis.

<table>
<thead>
<tr>
<th>Liability Limits</th>
<th>General Aggregate</th>
<th>Products/Completed Operation Aggregate</th>
<th>Each Occurrence</th>
<th>Personal/Advertising Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary General Liability</td>
<td>$2,000,000</td>
<td>$2,000,000</td>
<td>$1,000,000</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Umbrella or Excess Liability*</td>
<td>$5,000,000</td>
<td>$5,000,000</td>
<td>$5,000,000</td>
<td>$5,000,000</td>
</tr>
</tbody>
</table>

*Umbrella or Excess Liability does not apply to projects totaling $500,000 or under.

13. The following exclusionary endorsements are prohibited in the CGL policy:

i. Damage to work performed by subcontract/vendor (CG 22-94 or similar);
ii. Contractual liability coverage exclusion modifying or deleting the definition of an “insured contract”;
iii. If applicable to the work to be performed: Residential or multi-family;
iv. If applicable to the work to be performed: Exterior insulation finish systems;
v. If applicable to the work to be performed: Subsidence or earth movement.

C Automobile Liability

Bodily Injury and Property Damage for any owned, hired, and non-owned vehicles used in the performance of this contract

Minimum Limits:

  Bodily Injury/Property Damage (Each Accident) $1,000,000

D Workers Compensation

1. Statutory Benefits (Coverage A)
2. Employers Liability (Coverage B)
3. Policy shall contain a waiver of subrogation in favor of the Principal Representative.
4. This requirement shall not apply when a contractor or subcontractor is exempt under Colorado Workers’ Compensation Act., AND when such contractor or subcontractor executes the appropriate sole proprietor waiver form.

Minimum Limits:

<table>
<thead>
<tr>
<th>Coverage A (Workers’ Compensation)</th>
<th>Coverage B (Employers Liability)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statutory</td>
<td></td>
</tr>
<tr>
<td>Each accident $100,000</td>
<td>Disease each employee $100,000</td>
</tr>
<tr>
<td>Disease policy limit $500,000</td>
<td></td>
</tr>
</tbody>
</table>
E NOT USED

F Builder's Risk / Installation Floater

Unless otherwise provided or instructed by the Principal Representative, the Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the project is located, Builder's Risk Insurance in the amount of the initial contract amount as well as subsequent modifications for the entire project at the site on a replacement cost basis without optional deductibles. This coverage is required for new buildings or additions to existing buildings and for materials and equipment to be installed in existing structures.

1. Covered Cause of Loss: Special Form
2. Include Theft and Vandalism
3. Labor costs to repair damaged work
4. Shall be written for 100% of the completed value (replacement cost basis)
5. Deductible maximum is $50,000.00
6. Waiver of Subrogation is to apply
7. The Regents of the University of Colorado, a body corporate, shall be added as Additional Named Insured on Builders Risk.
8. Policy must provide coverage from the time any covered property becomes the responsibility of the Contractor, and continue without interruption during construction, renovation, or installation, including any time during which the covered property is being transported to the construction installation site, or awaiting installation, whether on or off site.
9. The Policy shall be maintained, unless otherwise provided in the contract documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than the Principal Representative has insurable interest in the property to be covered, whichever is later.
10. The Builder's Risk insurance shall include interests of the Principal Representative, and if applicable, affiliated or associated entities, the General Contractor, subcontractors and sub-tier contractors in the project.
11. Builders' Risk Coverage shall be on a Special Covered Cause of Loss Form and shall include theft, vandalism, malicious mischief, collapse, false-work, temporary buildings and debris removal including demolition, increased cost of construction, architect's fees and expenses, flood (including water damage), earthquake, and if applicable, all below and above ground structures, piping, foundations including underground water and sewer mains, piling including the ground on which the structure rests and excavation, backfilling, filling, and grading. Equipment Breakdown Coverage (a.k.a. Boiler & Machinery) shall be included as required by the Contract Documents or by law, which shall specifically cover insured equipment during installation and testing (including hot testing, where applicable). Other coverages may be required if provided in contract documents.
12. The Builder's Risk shall be written for 100% of the completed value (replacement cost basis) of the work being performed. The Builders' Risk shall include the following provisions:
   i. Replacement Cost Basis - including modification of the valuation clause to cover all costs needed to repair the structure or work (including overhead and profits) and will pay based on the values figured at the time of rebuilding or repairing, not at the time of loss
   ii. Modify or delete exclusion pertaining to damage to interior of building caused by an peril insured against are covered; also provide coverage for water damage.

Note, if the addition, or renovation is to an existing building, The Principal Representative requires that the Contractor provide as an option to include the existing building into the Builders' Risk Policy. The Principal Representative shall provide the replacement cost value of the existing building.
13. At the option of the Principal Representative, the Principal Representative may include Soft Costs (including Loss of Use/Delay in Opening Endorsement under the builder’s risk policy. The Principal Representative agrees to provide the necessary exposure base information for quotation by the Builder’s Risk carrier. The Principal Representative agrees to pay the premium associated with the Soft Costs coverage, the Principal Representative decides to purchase this coverage.

14. The Builders’ Risk Policy shall specifically permit occupancy of the building during construction. Partial occupancy or use of the work shall not commence until the insurance company or companies providing insurance have consented to such partial occupancy or use. The Principal Representative and Contractor shall take reasonable steps to obtain consent of the insurance company or companies and delete any provisions with regard to restrictions within any Occupancy Clauses within the Builders’ Risk Policy. The Builders’ Risk Policy shall remain in force until acceptance of the project by the Principal Representative.

15. The deductible shall not exceed $50,000 and shall be the responsibility of the Contractor except for losses such as flood (not water damage), earthquake, windstorm, tsunami, volcano, etc. Losses in excess of $50,000 insured shall be adjusted in conjunction with the Principal Representative. Any insurance payments/proceeds shall be made payable to the Principal Representative subject to requirements of any applicable mortgagee clause.

The Contractor shall pay subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require subcontractors to make payments to their sub-subcontractors in similar manner.

The Principal Representative shall have the authority to adjust and settle any losses in excess of $50,000 with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Principal Representative exercise of this power. It is expressly agreed that nothing in this section shall be subject to arbitration and any references to arbitration are expressly deleted.

16. The Contractor is responsible for providing 45 days’ notice of cancellation to the Principal Representative. The policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to the Project.

If the Contractor does not intend to purchase such Builder’s Risk Insurance required by the Contract and with all of the coverages in the amount described above, the Contractor shall so inform the Principal Representative as stated in writing prior to commencement of the work. The Principal Representative may then affect insurance that will protect the interests of the Principal Representative, the General Contractor, Subcontractors and sub-tier contractors in the project. Coverages applying shall be the same as stated above including other coverages that may be required by the Principal Representative. The cost shall be charged to the Contractor. Coverage shall be written for 100% of the completed value of the work being performed, with a deductible not to exceed $50,000 per occurrence for most projects.

All deductibles will be assumed by the Contractor. Waiver of Subrogation is to apply against all parties named as insureds, but only to the extent the loss is covered, and Beneficial Occupancy Endorsements are to apply.

If the Principal Representative is damaged by the failure or neglect of the Contractor to purchase or maintain insurance as described above, without so notifying the Principal Representative, then the Contractor shall bear all reasonable costs properly attributable thereto.
G **Contractors Pollution Liability**

1. Coverage shall apply to sudden and gradual pollution conditions resulting from the escape of release of smoke, vapors, fumes, acids, alkalis, toxic chemicals, liquids, or gases, natural gas, waste materials, or other irritants, contaminants, or pollutants (including asbestos). Policy shall cover the Contractor’s completed operations.

2. If the coverage is written on a claims-made basis, the Contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of this Contract; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of three (3) years beginning from the time that work under this contract is completed.

3. The policy shall be endorsed to include the following as Additional Insureds: The Regents of the University of Colorado, a Body Corporate, named as an additional insured with respect to liability and defense of suits arising out of the activities performed by, or on behalf of the Construction Manager, including completed operations.

4. Endorsements CA9948 and MCS-90 are required on the Automobile Liability Coverage if the Contractor is transporting any type of hazardous materials.

5. Contractors Pollution Liability policies must be kept in effect for up to three (3) years after completion of the project.

**Minimum Limits (Projects at or under $500,000):**

Per Loss  $ 1,000,000  
Aggregate  $ 1,000,000

**Minimum Limits (Projects over $500,000):**

Per Loss  $ 2,000,000  
Aggregate  $ 2,000,000

H **Professional Liability (Errors and Omissions)**

(This Professional Liability requirement (H) applies only to Design/Build Agreements SC-8.0 and 9.0.)

1. The Contractor shall maintain Errors and Omissions Liability covering negligent acts, errors and/or omissions, including design errors of the Contractor for damage sustained by reason of or in the course of operations under this Contract. The policy/coverages shall be amended to include the following:

   Amendment of any Contractual Liability Exclusion to state: “This exclusion does not apply to any liability of others which you assume under a written contract provided such liability is caused by your negligent acts.”

2. In the event that any professional liability insurance required by this Contract is written on a claims-made basis, Contractor warrants that any retroactive date under the policy shall precede the effective date of this Contract; and that either continuous coverage will be maintained or an extended discovery period will be exercised for a period of three (3) years beginning at the time work under this Contract is completed.

3. Policy shall contain a waiver of subrogation against The Regents of the University of Colorado, a Body Corporate.

Wrongful Act  $ 2,000,000  
General Aggregate  $ 2,000,000

I **ADDITIONAL INSURANCE REQUIREMENTS**
1. All insurers must be licensed or approved to do business within the State of Colorado, and unless otherwise specified, all policies must be written on a per occurrence basis.
2. Contractor’s insurance carrier should possess a minimum A.M. Best’s Insurance Guide rating of A-VI.
3. On insurance policies where the Principal Representative are named as additional insureds, the Principal Representative shall be additional insureds to the full limits of liability purchased by the Contractor even if those limits of liability are in excess of those required by this Contract.
4. Contractor shall furnish the Principal Representative with certificates of insurance (ACORD form or equivalent approved by the Principal Representative) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.
   All certificates and any required endorsements are to be received and approved by the Principal Representative before work commences.
   Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project. Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of contract.
5. Upon request by the Principal Representative, Contractor must provide a copy of the actual insurance policy effecting coverage(s) required by the contract.
6. The Contractor’s insurance coverage shall be primary insurance and non-contributory with respect to all other available resources.
7. The Contractor shall advise the Principal Representative in the event any general aggregate or other aggregate limits are reduced below the required per occurrence limit. At their own expense, the Contractor will reinstate the aggregate limits to comply with the minimum requirements and shall furnish to the Principal Representative a new certificate of insurance showing such coverage is in force.
8. Provide a minimum of thirty (30) days advance written notice to the Principal Representative for cancellation, non-renewal, or material changes to policies required under the Contract (45 days for builders’ risk coverage).

Failure of the Contractor to fully comply with these requirements during the term of the Contract may be considered a material breach of contract and may be cause for immediate termination of the Contract at the option of the Principal Representative. The Principal Representative reserves the right to negotiate additional specific insurance requirements at the time of the contract award.

Subcontracts
Contractor’s certificate(s) shall include all subcontractors as additional insureds under its policies or subcontractors shall maintain separate insurance as determined by the Contractor, however, subcontractor’s limits of liability shall not be less than $1,000,000 per occurrence / $2,000,000 aggregate.

Non-Waiver
The parties hereto understand and agree that the Principal Representative is relying on, and does not waive or intend to waive by any provision of this Contract, the monetary limitations or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, et seq., as from time to time amended, or otherwise available to the Principal Representative or its officers, employees, agents, and volunteers.

Mutual Cooperation
The Principal Representative and Contractor shall cooperate with each other in the collection of any insurance proceeds which may be payable in the event of any loss, including the execution and delivery of any proof of loss or other actions required to effect recovery.
4. **ARTICLE 23. TEMPORARY FACILITIES**

   1. Replace with the following:

   23.1 **OFFICE FACILITIES**

   The Contractor shall provide and maintain without additional expense for the duration of the Project temporary office facilities, as required and as specified, for its own use. Temporary office facilities for use by the Architect/Engineer, representatives of the Principal Representative and State Buildings Program shall only be provided if specifically identified in project requirements.

5. **ARTICLE 41. COMPLETION, FINAL INSPECTION, ACCEPTANCE AND SETTLEMENT**

   1. Add the following:

   41.5.g) Contractor will be required to complete items on University of Colorado Denver | Anschutz Medical Campus Supplemental Building / Project Acceptance List and attend walk-thrus and meetings necessary to complete the list, working through the university Project Manager (use University of Colorado Denver | Anschutz Medical Campus Supplemental / Project Acceptance List).

6. **ARTICLE 52. SPECIAL PROVISIONS**

   1. Add the Following:

   52.11 **UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS POLICY ON SEXUAL HARASSMENT**

   1. The Contractor shall vigorously pursue to the greatest extent possible, adherence to the University of Colorado Denver Policy on Sexual Harassment and also require all employees, and employees of all subcontractors of any kind, working on this project to adhere to this Policy.

   2. **Statement of Policy:** It is the policy of the University of Colorado Denver to maintain the community as a place of work, study, and residence free of sexual harassment or exploitation of students, faculty, staff, and administrators. Sexual harassment is prohibited on campus and in university programs. The university is committed to taking appropriate action against any of its officials, employees or students who violate the policy prohibiting sexual harassment.

   3. **Definition of Sexual Harassment:** For purposes of this Policy, sexual harassment is defined as conduct which is unwelcome and consists of:

      a. sexual advances;
      b. requests for sexual favors; or
      c. other verbal or physical conduct of a sexual nature when submission to such conduct is made either explicitly or implicitly a term or condition of an individual’s employment or academic decisions affecting the individual; or when such conduct has the purpose or effect, of unreasonably interfering with an individual’s work or academic performance by creating an intimidating, hostile, or offensive working or educational environment.

   Conduct prohibited under this policy may occur between persons of the same sex or of different sexes and may manifest itself in different ways. For
example, sexual harassment may be as undisguised as a direct solicitation of sexual favors, or arise from behavior which has the effect of creating an intimidating, hostile, or offensive educational or working environment. In this regard, the following types of acts, if pervasive and continuous, are more likely than not to be considered sexual harassment: unwelcome physical contact, sexual remarks about a person's clothing, body, or sexual relations, conversation of a sexual nature or similar jokes and stories, and the display of sexually explicit materials in the workplace or their use in the classroom without defensible educational purpose.

4. Consequence of Sexual Offenses: The university may require the Contractor to remove from university property any individual or individuals who violate the policy prohibiting sexual harassment.

5. The full Sexual Misconduct policy of the University of Colorado shall be followed and can be found at: https://www.cu.edu/ope/aps/5014

7. **ARTICLE 53. MISCELLANEOUS PROVISIONS**

   1. Add the Following:

   **52.27 UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS POLICY ON SECURITY BADGING**

   All costs and time associated with obtaining a University security badges for Contractor employees and subcontractors working on campus shall be borne by the Contractor. Badging shall be covered by Preconstruction Services Fee, Construction Services Fee, or included in lump-sum agreements and shall not be directly reimbursable.

   **52.28 UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS SMOKE-FREE AND TOBACCO-FREE ENVIRONMENT POLICY 3059.**

   All individuals on CU Denver and CU Anschutz property are prohibited from smoking and/or using any tobacco products, cigarettes, and electronic smoking/vaping products while on University property. The full policy can be found at: https://www.ucdenver.edu/policies
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT T: STATE SALES AND USE TAX DOCUMENTS
Special Notice

Purpose of this application
The exemption certificate for which you are applying must be used only for the purpose of purchasing construction and building materials for the exempt project described below. This exemption does not include or apply to the purchase or rental of equipment, supplies, and materials which are purchased, rented, or consumed by the contractor and which do not become a part of the structure, highway, road, street, or other public works owned and used by the exempt organization.

Any unauthorized use of the exemption certificate will result in revocation of your exemption certificate and other penalties provided by law.

A separate certificate is required for each project.

Colorado Withholding Account Number
A Colorado Account Number (CAN) should be provided in this field. Applications that are left blank or list N/A will not be processed and will be returned.

Subsidiary:
This box is marked when a subsidiary is using the parents withholding account number (only when it does not have its own.) Provide the parents CAN.

Subcontractor:
This box is marked when a contractor does not have employees of their own and outsources their employees through a subcontractor. List the subcontractor or subcontractors name and CAN(s).

Staffing Agency:
This box is marked when a contractor does not have employees of their own and outsources their employees through a staffing agency. Provide the Staffing Agency’s name and CAN.

No employees/no subcontractors:
For contractors with no employees, no subcontractors/staffing agencies:

Write no employees in the (CAN) box and provide explanation. For example, I have no employees or subcontractors and perform all of the work myself.

Subcontractors:
Subcontractors will not be issued Certificates of Exemption by the Department of Revenue. Upon receipt of the Certificate, the prime contractor should make a copy for each subcontractor involved in the project and complete it by filling in the subcontractor’s name and address and signing it. The original Certificate should always be retained by the prime contractor. Copies of all Certificates that the prime contractor issued to subcontractors should be kept at the prime contractor’s place of business for a minimum of three years and be available for inspection in the event of an audit.

See FYI Sales 95 for information about qualifying affordable housing projects.

To avoid a returned application ensure you have done the following:

- Accurately completed all applicable boxes of the form.
- Provided a copy of the Contract or agreement page. The Contract or Agreement page lists the type and scope of work.
- Bid amount on Contract or Agreement page matches the amount listed on the application (to the penny).
- Contract or Agreement page contains the signatures of the contracting parties.
- The form DR0172 (application) is signed.
- The exempt organizations number was provided and is correct.
Contractor Application for Exemption Certificate

This exemption does not include or apply to the purchase or rental of equipment, supplies, and materials which are purchased, rented, or consumed by the contractor and which do not become a part of the structure, highway, road, street, or other public works owned and used by the exempt organization. Any unauthorized use of the exemption certificate will result in revocation of your exemption certificate and other penalties provided by law. A separate certificate is required for each contract.

Send completed forms to: Colorado Department of Revenue, Denver, CO 80261-0009
Failure to accurately complete all boxes of the form or provide all supporting documentation will cause the application to be denied.

For Department Use Only. Do not write in this section.

<table>
<thead>
<tr>
<th>Contractor/Account No.</th>
<th>Period (MM/DD/YYYY)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Contractor Information**

<table>
<thead>
<tr>
<th>Trade name/DBA</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Owner, partner or corporate last name</th>
<th>First Name</th>
<th>Middle Initial</th>
</tr>
</thead>
<tbody>
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<table>
<thead>
<tr>
<th>Mailing Address</th>
<th>City</th>
<th>State</th>
<th>Zip</th>
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<table>
<thead>
<tr>
<th>E-Mail Address</th>
<th>FEIN</th>
<th>Bid amount for your contract (Must match to the penny)</th>
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<td></td>
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<tr>
<th>Fax number</th>
<th>Business Phone number</th>
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<table>
<thead>
<tr>
<th>Colorado withholding tax account number</th>
<th>Subsidiary</th>
<th>Subcontractors</th>
<th>Staffing Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>(See instructions)</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

No Employees/Subcontractors. (Provide explanation or attach a letter of explanation).

**Exemption Information**

Copies of contract or agreement page, identifying the contracting parties, bid amount, type of work, and signatures of contracting parties must be attached.

<table>
<thead>
<tr>
<th>Name of exempt organization (as shown on contract)</th>
<th>Exempt organization’s number</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Colorado Denver</td>
<td>98 02565</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Address of exempt organization</th>
<th>City</th>
<th>State</th>
<th>Zip</th>
</tr>
</thead>
<tbody>
<tr>
<td>1945 Wheeling St, Mail Stop F418</td>
<td>Aurora</td>
<td>CO</td>
<td>80045</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Principal contact at exempt organization-Last Name</th>
<th>First Name</th>
<th>Middle Initial</th>
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</thead>
<tbody>
<tr>
<td>Akkey</td>
<td>Todd</td>
<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Housing Authority (if applicable)</th>
<th>Name of Project (if applicable)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>($ProjectName)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Owner of the Project (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical location of project site (give actual address when applicable and Cities and/or County (ies) where project is located)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City</th>
<th>State</th>
<th>Zip</th>
<th>Principal contact’s telephone number</th>
</tr>
</thead>
<tbody>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Scheduled construction start date (MM/DD/YYYY)</th>
<th>Estimated completion date (MM/DD/YYYY)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

I declare under penalty of perjury in the second degree that the statements made in this application are true and complete to the best of my knowledge.

Signature of the business owner, partner or corporate officer | Title of corporate officer | Date (MM/DD/YYYY) |
|-------------------------------------------------------------|--------------------------|-------------------|
CERTIFICATE OF EXEMPTION FOR STATE SALES/USE TAX ONLY

<table>
<thead>
<tr>
<th>USE ACCOUNT NUMBER</th>
<th>LIABILITY INFORMATION</th>
<th>ISSUE DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>09802565</td>
<td>G 010180</td>
<td>Aug 25 2017</td>
</tr>
</tbody>
</table>

THIS LICENSE IS NOT TRANSFERABLE

STATE OF COLORADO/ OFFICE OF STATE
CONTROLLER
ATTN. OFFICE OF UNIVERSITY CONTROLLER
1800 N GRANT ST STE 800
DENVER CO 80203-1148

Executive Director
Department of Revenue
Sales Tax Exemption Certificate  
Multi - Jurisdiction

See page 2 for instructions

Last Name or Business Name

First Name

Middle Initial

Address

City

State

ZIP

I Certify That

Name of Firm (Buyer)

Regents of University of Colorado

Address

1800 Grant Street, Suite 600

City

Denver

State

CO

ZIP

80203

Qualifies As (Check each applicable item)

☐ Wholesaler

☐ Retailer

☐ Manufacturer

☐ Charitable or Religious

☒ Political Subdivision or Governmental Agency

☐ Other (Specify)

If Other, specify here

1) and is registered with the below listed states and cities within which your firm would deliver purchases to us

which are for resale or lease by us in the normal course of our business which is 
Institution of Higher Education or

2) that such purchases are exempt from payment of sales or use tax in such states and cities because our buyer is:

☒ Political Subdivision or Governmental Agency

☐ Charitable or Religious

☐ Otherwise Exempt By Statute (Specify)

If Otherwise Exempt By Statute, specify here

City or State

City of Aurora

State Registration or ID Number

98-00799-0000

City or State

City of State

Colorado (Boulder campus)

State Registration or ID Number

98-02915-0000

City or State

City of State

Colorado

State Registration or ID Number

98-02565-0000

City or State

City of State

Texas

State Registration or ID Number

32002730391

City or State

City of State

Colorado Springs

State Registration or ID Number

E00001021

City or State

City of State

State Registration or ID Number

If the list of states and cities is more than six(6), attach a list to this certificate.

I further certify that if any property so purchased tax free is used or consumed by the firm as to make it subject to a Sale or Use Tax we will pay the tax due direct to proper taxing authority when state law so provides or inform the seller for added tax billing. This certificate shall be part of each order which we may hereafter give to you, unless otherwise specified, and shall be called until canceled by us in writing or revoked by the city or state.

General Description of products to be purchased from seller

Under penalties of perjury, I swear or affirm that the information on this form is true and correct as to every material matter.

Authorized Signature (Owner, Partner or Corporate Officer)

Brent C. Kueker

Title

Assoc. Vice President/University Controller

Date (mm/dd/yyyy)

2/21/23
March 12, 2001

Wayne F. Henderson
Vice Chancellor for Administration and Finance
University of Colorado Health Sciences Center
Fitzsimons, Building 500, Room C1003
P.O. Box 6508
Aurora, Colorado 80045-0508

RE: Letter of Commitment

Dear Mr. Henderson:

I am in receipt of your letter dated February 27, 2001, requesting that I issue a letter of commitment to the University of Colorado Health Sciences Center ("UCHSC") pursuant to City Code Section 130-63(c). It is my understanding that UCHSC is part and parcel of the University of Colorado, a public institution of higher education of the State of Colorado. § 23-20-101, et seq., C.R.S. You have asked for some assurance that UCHSC is exempt from the payment of City sales and use tax, as well as the employer portion of the City occupational privilege tax.

_City Code Section 130-157(1)_ exempts all sales of tangible personal property and taxable services to the various political subdivisions of this state from imposition of City sales tax. Identical exemptions exist in both the City Use Tax ordinance (City Code § 130-198(5)) and the City Employer Occupational Privilege Tax ordinance (City Code § 130-405(1)). Accordingly, UCHSC falls squarely within each of these three exemptions.

It should be noted, however, that these exemptions do not extend to the collection of City tax. For instance, UCHSC must collect, report, and remit City sales tax on any retail sale of tangible personal property or taxable services it makes to a non-exempt third party. _City Code § 130-160_. Likewise, UCHSC
must also collect, report, and remit the employee portion of the City occupational privilege tax for each person it employs within the City for any period of time within a calendar month sufficient to receive no less than $250.00 as compensation for such employment. City Code § 130-464.

With respect to the deposit and ultimate payment of City use tax on construction materials, it is the longstanding policy of the City that the party who contracts for and directs and controls the construction of building improvements is liable for such tax. See Fifteenth Street Investment Co. v. People, 102 Colo. 571, 81 P.2d 764 (1938). Under the circumstances described in your request, it is UCHSC, and not its contractors, upon whom sole liability for the payment of City use tax would rest. Because UCHSC is an exempt entity, no use tax is due and owing on the purchase and subsequent use of construction materials for the development of UCHSC’s property at the Fitzsimons site.

With regard to your additional requests, the City has no objection if UCHSC’s contractors wish to use this letter to present to City building officials and third-party retailers as evidence of UCHSC’s tax exemption. As for any future revocation of this letter, unless the status of UCHSC as a political subdivision changes, the various City tax exemptions which UCHSC is entitled to claim cannot be lawfully repealed without the prior approval of the City’s voters. See Colo. Const. Art. X, § 20(4)(c). Therefore, the City believes UCHSC will be adequately informed in the event that the City decides to seek approval for any change in its tax laws that would impact UCHSC’s tax-exempt status.

Very truly yours,

John Gross
Director of Finance
February 19, 2014

University of Colorado
Procurement Service Center
1800 Grant Street, Suite 500
Denver, CO 80203

Ladies/Gentlemen:

The above named entity is exempt from the Denver sales tax per Sec. 53-26(1) of the City Retail Sales Tax Article:

Sec. 53-26 (1) Exemptions

There shall be exempt from taxation under the provisions of this Article the following: (1) All sales to the United States Government, to the State, its departments and institutions and the political subdivisions thereof, only when purchased in their governmental capacities.

To qualify for the exemption, purchases must be billed direct to the organization, and payment made from funds of the organization.

The exemption does not extend to construction contractors who may perform contracts for you; they are the consumer of all property purchased and used in the performance or contracts for others. Nor does the exemption apply to purchases by employees or members for their own personal use.

You may reproduce this letter to furnish to suppliers as needed.

Sincerely,

[Signature]

Donald Korte, Audit Manager
Tax Compliance/Audit Section
720-913-9339
Michael J. Barden
University of Colorado at Denver and Health Sciences Center (UCDHSC)
Building 500, Mail Stop F418
P.O. Box 6508
Aurora CO 80045

April 7, 2006

Dear Mr. Barden:

This is in response to your letter of March 1, 2006, to Bruce Nelson of the Department of Revenue regarding sales tax exemption from county and special district sales taxes for UCDHSC construction projects at the Fitzsimons campus. Mr. Nelson has left the Department, so I am responding to your inquiry.

In regards to Adams County sales and use tax, the sales tax is collected by the Department of Revenue, not the city of Aurora. Use tax on building materials is collected by the county when issuing building permits. Under 29-2-105(d), 39-26-708(1)(a) and 39-26-708(2)(a), C.R.S., UCDHSC and its contractors and sub-contractors are exempt from county sales and use tax on construction and building materials for State/UCDHSC owned real property.

In regards to special district sales and use taxes, UCDHSC and its contractors and sub-contractors are exempt from sales and use tax pursuant to the exemptions granted in 39-26-708(1)(a) and 39-26-708(2)(a), C.R.S., for the Regional Transportation District under 32-9-119(2)(c)(II), C.R.S, for the Scientific and Cultural District under 32-13-107(2), C.R.S, and for the Metropolitan Football Stadium District under 32-15-110(2)(a), C.R.S.

Additionally, for construction projects in the City and County of Denver, UCDHSC and its contractors and sub-contractors are exempt from the aforementioned special district sales and use taxes, as well as state sales and use tax.

Should you have additional questions regarding these matters, feel free to contact me.

Respectfully,

Steve Asbell
Taxpayer Service Policy Group
Colorado Dept of Revenue
Ph:303.866.3889 email: sasbell@spike.dor.state.co.us
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR’S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT Y: SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS AND MINORITY/WOMEN BUSINESS ENTERPRISE PARTICIPATION REPORT
SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS AND
MINORITY/WOMEN BUSINESS ENTERPRISE PARTICIPATION REPORT

Institution/Agency: {Campus} {DeptID}
Project No./Name: {Number} / {Name}

TO BE ELIGIBLE FOR AWARD OF THIS CONTRACT, EACH CONTRACTOR (INCLUDING
ARCHITECT/ENGINEER/CONSULTANT/CONTRACTOR) IS REQUESTED TO COMPLY WITH THESE
REQUIREMENTS.

I. The undersigned Architect/Engineer/Consultant/Contractor hereby certifies that the [____](company) [____](joint
venture) [____](is) [____](is not)* a service-disabled veteran-owned enterprise as defined in this report. The
undersigned Architect/Engineer/Consultant/Contractor hereby certifies that the [____](company) [____](joint
venture) [____](is) [____](is not)* a minority enterprise as defined in this report. The undersigned
Architect/Engineer/Consultant/Contractor hereby certifies the [____](company) [____](joint venture) [____](is)
[____](is not)* a woman-owned business enterprise as defined. (*Strike out where inapplicable.)

*Persons signing hereby swear and affirm that they are authorized to act on
Architect/Engineer/Consultant/Contractor’s behalf and acknowledge that the State is relying on their representations
to that effect. **Principal is not a recognized title and will not be accepted**

ARCHITECT/ENGINEER/CONSULTANT/CONTRACTOR

{VendorName}
Legal Name of Contracting Entity

*Signature

By: {VendorFirstName}, {VendorTitle}
Name (print) Title

Date:

II. It is the general policy of the State of Colorado to be as inclusive as possible to all member communities when
spending taxpayer dollars. It is also the intent of the State to address the goals of the HB14-1224 • CRS 24-103-211
of at least 3% of all contracts by dollar value to be awarded to SDVOSBs.

III. REQUIREMENTS

A. Service-Disabled Veteran-Enterprise (SDVE) means for the purpose of this report, a business who must be
incorporated or organized in Colorado or they must maintain a place of business or have an office in
Colorado and who are officially registered and verified as a SDVOSB by the Center for Veteran Enterprise
within the U.S. Department of Veterans Affairs (www.vip.vetbiz.gov) per CRS 24-103-211

B. Minority Business Enterprise (MBE) means, for the purpose of this report, a business enterprise at least 51
percent that is owned and controlled by minority group members, or, in the case of a publicly owned
business, at least 51 percent of the stock of which is owned and controlled by minority group members.
Eligible persons are expected to be engaged full time in the day-to-day operation and management of the
business. Minority group members are ethnic minorities including African American, Hispanic American,
Native American or Asian/Pacific American.

C. Women Business Enterprise (WBE) means, for the purpose of this report, a business enterprise of at least
51 percent of which is owned and controlled by a woman or women, or, in the case of a publicly-owned
business, at least 51 percent of the stock of which is owned and controlled by women. Women are
expected to be engaged full time in the day-to-day operation and management of the business.
D. The University of Colorado Denver | Anschutz Medical Campus does not have a certification process for nor
does it require MBE’s and WBE’s to be certified.

E. The percentages of service-disabled veteran, minority and women-owned business participation will be
determined by dollar value of the work subcontracted to or joint ventured with service-disabled veteran,
minority, and women-owned firms, as compared to the total dollar value of the bid amount for all work bid
under this contract.

F. Prior to the award of this contract, the contractor will be required to provide to the Principal Representative a
list of SDV/M/WBE enterprises, stipulating the dollar amount of each subcontract or supplier of materials on
page 2 of this Service-Disabled Veteran, Minority and Women Business Enterprises Participation Report.

G. The contractor will retain records and documents showing the level of participation for two years following
completion of this contract. These records and documents, or copies thereof, will be made available at
reasonable times and places for inspection by an authorized representative of the Principal Representative,
or its designated representatives, and will be submitted to such representatives upon written request.

ARCHITECT/ENGINEER/CONSULTANT/CONTRACTOR:
SDVOE: Yes [ ] MBE: Yes [ ] WBE: Yes [ ]
       No [ ]   No [ ]   No [ ]

Total Contract Amount: $ \{AgmtTotalNumeric\}.

<table>
<thead>
<tr>
<th>Name and Address of SDV/M/WBE Subcontractors and/or Suppliers and/or Self-Performed Work by SDV/M/WBE Primes*</th>
<th>SDVE Contract Amounts</th>
<th>MBE Contract Amounts</th>
<th>WBE Contract Amounts</th>
<th>Type of Work</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

*Indicate ethnicity based on Paragraph III. A. above.

Total SDVE Contracts: $ ____________________________
Total MBE Contracts: $ ____________________________
Total WBE Contracts: $ ____________________________
Total SDVE %: __________________________________
Total MBE %: __________________________________
Total WBE %: __________________________________
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACTOR'S DESIGN/BID/BUILD AGREEMENT
(STATE FORM SC-6.21)

EXHIBIT Z: MISCELLANEOUS DOCUMENTS

Notice of Award (D/B/B Agreements)
Notice to Proceed (D/B/B Agreements)
# NOTICE OF AWARD

(Design/Bid/Build and Design/Build Lump Sum Agreements)

<table>
<thead>
<tr>
<th>Date of Notice:</th>
<th>{$NoticeOfAwardDate}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency/Institution:</td>
<td>{$Campus}</td>
</tr>
<tr>
<td>Project No./Name:</td>
<td>{$ProjectNumber} / {$ProjectName}</td>
</tr>
</tbody>
</table>

TO: {$VendorSignerName}

{$VendorName}

{$VendorAddress}

The State of Colorado, represented by the undersigned, has considered the Proposals submitted for the above described work.

Your Proposal, deemed to be in the best interest of the State of Colorado, in the amount of {$AgmtTotalWritten} DOLLARS AND NO/100* ({$AgmtTotalNumeric}) is hereby accepted, pending final execution of the Agreement.

You are required to execute the approved Agreement and to furnish the Performance Bond, Labor and Material Payment Bond, Insurance Policy and Certificates of Insurance, Apprenticeship Utilization Certification(s) (if applicable) and Labor Overhead (Direct Labor Burdens) for Work performed by Contractor and major Subcontractors within ten (10) days from the date of this Notice.

If you fail to execute said Agreement and to furnish said Performance Bond, Labor and Material Payment Bond, Insurance Policy, Certificates of Insurance, and Labor Overhead (Direct Labor Burdens) as described above within ten (10) days from the date of this Notice, the State Controller is entitled to retain the amount of the Proposal Guaranty submitted with your Proposal as Liquidated Damages. In this event, the right is reserved to consider all of your rights arising out of the acceptance of your Proposal as abandoned and to award the work covered by your Proposal to another, or to re-advertise the Project, or otherwise dispose thereof.

By

State Buildings Program (or Authorized Delegate) Date

By

Principal Representative (Agency/Institution) Date

When completely executed, this form is to be sent by certified mail to the Contractor by the Principal Representative or delivered by any other means to which the parties agree.
STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

**NOTICE TO PROCEED (DESIGN/BID/BUILD CONTRACT)**

<table>
<thead>
<tr>
<th>Date of Notice:</th>
<th>Date to be inserted by the Principal Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date/Description of Contract Documents:</td>
<td>(${ConstDocsDate}, (${ConstDocsDesc})</td>
</tr>
<tr>
<td>Institution/Agency:</td>
<td>(%Campus)</td>
</tr>
<tr>
<td>Project No./Name:</td>
<td>(${ProjectNumber} / (${ProjectName})</td>
</tr>
</tbody>
</table>

---

**Attach Notice of Code Compliance from Code Review Agent/Building Official for Documents Listed Above**

To: ${VendorSignerName}

${VendorName}

${VendorAddress}

This is to advise you that your Performance Bond, Labor and Material Payment Bond, Insurance Policy and Certificates of Insurance have been received. Our issuance of this Notice does not relieve you of responsibility to assure that the bond and insurance requirements of the Contract Documents are met for the duration of the Agreement. The Agreement dated _____ covering the above described work has been fully executed.

You are hereby authorized and directed to proceed within ten (10) days from date of this Notice as required in the Agreement. Any liquidated damages for failure to achieve Substantial Completion by the date agreed that may be applicable to this Contract will be calculated using the date of this Notice for the date of the commencement of the Work.

**The total completion date (including close-out) of the Project is _____ (M/D/YYYY).**


<table>
<thead>
<tr>
<th>State Buildings Program (or Authorized Delegate)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>By</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Principal Representative (Institution or Agency)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>By</td>
<td></td>
</tr>
</tbody>
</table>

When completely executed, this form is to be sent to the Contractor by the Principal Representative.

State Form SBP-6.26  
Rev. 08/2022
SECTION 00 55 01 – NOTICE TO PROCEED TO COMMENCE CONSTRUCTION PHASE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 NOTICE TO PROCEED


   B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 55 01
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

NOTICE TO PROCEED TO COMMENCE CONSTRUCTION PHASE
(CM/GC CONTRACT)

<table>
<thead>
<tr>
<th>Date of Notice:</th>
<th>Date to be inserted by the Principal Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amendment No./Date:</td>
<td></td>
</tr>
<tr>
<td>Bid Package(s) No.:</td>
<td></td>
</tr>
<tr>
<td>Institution/Agency:</td>
<td>University of Colorado Denver</td>
</tr>
<tr>
<td>Project No./Name:</td>
<td>21-174017 – CU Denver Building Electrical System Upgrades</td>
</tr>
</tbody>
</table>

Attach Notice of Code Compliance from Code Review Agent/Building Official for Documents Listed Above

To:

This is to advise you that your Performance Bond, Labor and Material Payment: Bond, Insurance Policy and Certificates of Insurance, and Affidavit Regarding Unauthorized Immigrants have been received. Our issuance of this Notice does not relieve you of responsibility to assure that the bond and insurance requirements of the Contract Documents are met for the duration of the Agreement. The Amendment # _____ for the above described work has been fully executed.

You are hereby authorized and directed to proceed within ten (10) days from date of this Authorization as required in the Agreement. Any liquidated damages for failure to achieve Substantial Completion by the date agreed that may be applicable to this contract will be calculated using the date of this Notice for the date of the commencement of the Work.

By ______________________________ Date ______________________________
State Buildings Program (or Authorized Delegate)

By ______________________________ Date ______________________________
Principal Representative (Institution or Agency)

When completely executed, this form is to be sent by certified mail to the Construction Manager by the Principal Representative; or delivered by any other means to which the parties agree.
SECTION 00 62 16 – CERTIFICATE OF INSURANCE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 CERTIFICATE OF INSURANCE

   A. Sample Certificate of Liability Insurance and language.
   B. Sample Evidence of Property Insurance (Builder’s Risk)
   C. A copy of the above noted forms are attached to the end of this section.

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 62 16
CERTIFICATE OF LIABILITY INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFER NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER
COMPANY
ADDRESS
CITY, STATE, ZIP CODE

CONTACT NAME
PHONE (A/C, No, Ext):
FAX (A/C, No):
E-MAIL ADDRESS:

INSURER(S) AFFORDING COVERAGE
NAIC #
INSURER A:
INSURER B:
INSURER C:
INSURER D:
INSURER E:
INSURER F:

INSURED
INSURED NAME
INSURED ADDRESS
INSURED CITY, STATE, ZIP CODE

COVERAGES
CERTIFICATE NUMBER:
REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

<table>
<thead>
<tr>
<th>INSR LTR</th>
<th>TYPE OF INSURANCE</th>
<th>ADDL/ SUBR INSID WD</th>
<th>POLICY NUMBER</th>
<th>POLICY EFF (MM/DD/YYYY)</th>
<th>LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>COMMERCIAL GENERAL LIABILITY</td>
<td>CLAIMS-MADE OCCUR POLLUTION LIABILITY</td>
<td>Y</td>
<td>01/01/2019</td>
<td>01/01/2020</td>
</tr>
</tbody>
</table>

GENL AGGREGATE LIMIT APPLIES PER: POLICY PROJECT LOC OTHER:

| B        | AUTOMOBILE LIABILITY | ANY AUTO OWNED AUTOS ONLY SCHEDULED AUTOS HIRED AUTOS ONLY | Y Y POLICY NUMBER | 01/01/2019 | 01/01/2020 | COMBINED SINGLE LIMIT (Ex accident) $1,000,000 |

| UMBRELLA LIABILITY OCCUR CLAIMS-MADE | DED RETENTION $ | |

| D        | WORKERS COMPENSATION AND EMPLOYERS’ LIABILITY ANY PROPRIETOR/ PARTNER EXECUTIVE OFFICER/MEMBER EXCLUDED (Mandatory in NH) | Y N/A Y POLICY NUMBER | 01/01/2019 | 01/01/2020 | E.L. EACH ACCIDENT $100,000 |

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

The Regents of the University of Colorado, a Body Corporate are named as Additional Insured as respects General, Pollution and Automobile Liability policies.

The Automobile, Workers Compensation and Professional Liability policies are endorsed to include a Waiver of Subrogation in favor of The Regents of the University of Colorado, a Body Corporate.

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

The Regents of the University of Colorado
Attn: Project Management
1945 North Wheeling Street, Campus Mail stop F-418
Aurora, CO 80045

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ACORD 25 (2016/03) The ACORD name and logo are registered marks of ACORD
THIS EVIDENCE OF PROPERTY INSURANCE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFER NO RIGHTS UPON THE ADDITIONAL INTEREST NAMED BELOW. THIS EVIDENCE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS EVIDENCE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE ADDITIONAL INTEREST.

AGENCY
COMPANY
ADDRESS
CITY, STATE, ZIP CODE

PHONE (A/C. No. Ext.)

FAX (A/C. No.):
CODE:
AGENCY CUSTOMER ID:

INSURED
INSURED NAME
INSURED ADDRESS
INSURED CITY, STATE, ZIP CODE

COMPANY
INSURANCE COMPANY

EFFECTIVE DATE
01/01/2019

PROPERTY INFORMATION
LOCATION/DESCRIPTION
LOCATION OF PROJECT
Builders Risk is required for new buildings or alterations to existing buildings and for materials and equipment to be installed in existing structures.

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS EVIDENCE OF PROPERTY INSURANCE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

COVERAGE INFORMATION

PERILS INSURED
BUILDERS RISK - 100% OF COMPLETED VALUE

BASIC

BROAD

SPECIAL

AMOUNT OF INSURANCE
100% Project Value

DEDUCTIBLE
$50,000 or les

REMARKS (Including Special Conditions)
RE: Specific Project

CANCELLATION
SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

ADDITIONAL INTEREST
NAME AND ADDRESS

The Regents of the University of Colorado
Attn: Project Management
1945 North Wheeling Street, Campus Mail stop F-418
Aurora, CO 80045

ADDITIONAL INSURED

MORTGAGEE

LENDER’S LOSS PAYABLE

WAIVER OF SUBROGATION

LOAN #

AUTHORIZED REPRESENTATIVE

AUTHORIZED REPRESENTATIVE SIGNATURE

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SECTION 00 62 76 – APPLICATION FOR PAYMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. Section includes administrative and procedural requirements for managing the contractual requirements of this Project.

B. Related Requirements:
   1. 01 29 00 – Payment Procedures

1.03 DEFINITIONS (Not Applicable)

1.04 FORMS

A. APPLICATION AND CERTIFICATE FOR CONTRACTORS PAYMENT (SBP-7.2)
   1. Download Link: https://drive.google.com/open?id=0ByG39KP3LPICVHvqenLYSGJiMFE

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 62 76
SECTION 00 63 46 – CHANGE ORDER BULLETIN

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY

A. Section includes administrative and procedural requirements for managing the contractual requirements of this Project.

1.03 DEFINITIONS (Not Applicable)

1.04 CHANGE ORDER BULLETIN


B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 63 46
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CHANGE ORDER BULLETIN

Change Order Bulletin No: ___________________________ Date ___________________________
Contractor: 
Institution or Agency: University of Colorado Denver
Project No./Name: 21-174017 – CU Denver Building Electrical System Upgrades
Description of Work: 

This bulletin is issued to define the scope of revision in drawings and/or specifications for a contemplated change order. The work called for by these revisions shall be in accordance with the requirements of the original contract documents.

Please prepare and submit a proposal for the changes described below. For pricing use State Form SC-6.312. A formal change order State Form SC-6.31 will be issued after approval of your proposal by State Buildings Program and the Architect. Your proposal shall include a statement as to the effect this change will have on the time for completion of the project.

This bulletin is **NOT** an authorization to proceed.

DESCRIPTION OF CHANGE:

SPECIFICATION REVISIONS:

STATUS OF EXISTING WORK:

PREPARED BY: ___________________________
ARCHITECT/ENGINEER OR CONTRACTOR

APPROVED BY: ___________________________
STATE BUILDINGS PROGRAM
(or Authorized Delegate)
SECTION 00 63 53 – CHANGE ORDER PROPOSAL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 CHANGE ORDER PROPOSAL

A. State of Colorado form "Change Order Proposal" (SC-6.312).
   1. Download link:
      https://drive.google.com/file/d/1Uo7i4h3LqpByA8GUYEISk9qne_8hSwtS/view

B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 63 53
# Change Order Proposal

**Change Order Proposal No.:** [Enter number]  
**Date:** [Enter date]  

**Description of Work:** [Enter description]  
**Date:** [Enter date]

---

## PART I - WORK PERFORMED BY CONTRACTOR

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Formula</th>
<th>Unit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Direct Labor Costs</td>
<td>$1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Labor Overhead (Direct Labor Burden)</td>
<td>$(x Line 1)</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Total Contractor's Labor Costs (Lines 1 and 2)</td>
<td>$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Direct Materials Costs</td>
<td>$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Materials Overhead (Delivery Costs &amp; Taxes)</td>
<td>$(x Line 4)</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Total Materials Costs (Lines 4 and 5)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Total Equipment Costs</td>
<td>$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>PART I - TOTAL CONTRACTOR'S L, M &amp; E COSTS (Lines 3, 6 and 7)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
</tbody>
</table>

---

## PART II - WORK PERFORMED BY SUBCONTRACTOR

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Formula</th>
<th>Unit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Direct Labor Costs</td>
<td>$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Labor Overhead (Direct Labor Burden)</td>
<td>$(x Line 9)</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Total Subcontractor's Labor Costs (Lines 9 and 10)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Direct Materials Costs</td>
<td>$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Materials Overhead (Delivery Costs &amp; Taxes)</td>
<td>$(x Line 12)</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Total Subcontractor's Materials Costs (Lines 12 and 13)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Total Subcontractor's Equipment Costs</td>
<td>$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Total Subcontractor's L, M &amp; E Costs (Line 11, 14 and 15)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Subcontractor's Overhead (Indirect Costs)</td>
<td>$(0.0% x Line 16)</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Subcontractor's Profit (on Line 18)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>PART II - TOTAL SUBCONTRACTOR'S COSTS (Lines 16, 17 and 18)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
</tbody>
</table>

---

## PART III - CONTRACTOR'S OVERHEAD & PROFIT

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Formula</th>
<th>Unit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Contractor's Overhead (Indirect Costs)</td>
<td>$(10.0% x Part I Total)</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Contractor's Profit (on Line 19)</td>
<td>$(5.0% x Part I Total)</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>PART III - TOTAL CONTRACTOR OVERHEAD &amp; PROFIT (Lines 20 and 21)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
</tbody>
</table>

---

## PART IV - CONTRACTOR'S MARKUP ON SUBCONTRACTOR

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Formula</th>
<th>Unit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>Contractor's Commission on Subcontractor</td>
<td>$(5.0% x Part II Total)</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Contractor's Profit (on Line 19)</td>
<td>$(5.0% x Part II Total)</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>PART IV - TOTAL CONTRACTOR MARKUP ON SUBCONTRACTOR (Lines 23 and 24)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
</tbody>
</table>

---

## PART V - SUBTOTAL C.O. PROPOSAL (Parts I and II and III and IV)

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Formula</th>
<th>Unit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>SUBTOTAL C.O. PROPOSAL (Parts I and II and III and IV)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
</tbody>
</table>

---

## PART VI - CONTRACTOR'S BOND COST

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Formula</th>
<th>Unit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>CONTRACTOR'S BOND COST</td>
<td>$(x Part V Total)</td>
<td>$</td>
<td>$0.00</td>
</tr>
</tbody>
</table>

---

## PART VII - GRAND TOTAL CHANGE ORDER PROPOSAL (Sum of Totals: Parts V and VI)

<table>
<thead>
<tr>
<th>Line</th>
<th>Description</th>
<th>Formula</th>
<th>Unit</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>GRAND TOTAL CHANGE ORDER PROPOSAL (Sum of Parts V and VI)</td>
<td>$</td>
<td>$0.00</td>
<td></td>
</tr>
</tbody>
</table>

---

## PART VIII - CONTRACT TIME (CALENDAR DAYS CHANGED)

- [ ] EXTENDED
- [ ] NO CHANGE
- [ ] REDUCED

**The time of completion may change by the calendar days indicated (above) from the total number of days listed in the contractor's agreement to complete the entire project.**

---

**CONTRACTOR'S CERTIFICATE:**

This is to certify that, to the best of my knowledge and belief, the cost/price data submitted in response to the listed C.O. Bulletin, are accurate, complete and current as of __________.

Firm: __________________________  
Name & title: ____________________  
Signature: ______________________  
Date: ________________

**ARCHITECT/ENGINEER'S CERTIFICATE:**

This is to certify that I have analyzed the proposal and find, to the best of my knowledge and belief, that the proposal represents current, fair, factual and competitive cost/price data.

Firm: __________________________  
Name & title: ____________________  
Signature: ______________________  
Date: ________________

*The proposal shall remain in full force and effect for a period of _______ calendar days from date of signature.

---

**STATE BUILDINGS PROGRAMS (or Authorized Delegate)**

Date: ________________

---

**SC-6.312 (Rev. 7/2018)**
INSTRUCTIONS FOR COMPLETING "CHANGE ORDER PROPOSAL" COST/PRICE DATA SUMMARY (STATE FORM SC-6.312)

(enter information only in YELLOWED cells)

Enter Change Order Proposal Number, Date Created, Contractor's Name, Agency/Institution, State Project Number and Name.
REFERENCE: Enter Change Order Bulletin Number, Date Issued, and Description of Changes from Bulletin, noting exceptions which are listed in the Bulletin but are excluded, i.e., not priced on this form.

PART I - WORK PERFORMED BY CONTRACTOR:

Line 1. Direct Labor Costs: Fill in subtotal of direct labor costs which includes base rates plus applicable fringe benefits. On Contractor's (or Sub's) letterhead show costs as follows:

<table>
<thead>
<tr>
<th>Trade</th>
<th>Rate</th>
<th>Duration</th>
<th>=</th>
<th>Extended Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Line 2. Labor Overhead (Direct Labor Burdens, etc.): Enter percentage (as submitted in Schedule of Values) of Line 1 as applicable. (Spreadsheet calculates the total)

Line 3. Contractor's Labor Costs: Total of Lines 1 and 2. (Spreadsheet calculates the total)

Line 4. Direct Material Cost: Support with quotes or invoices. Fill in subtotal of direct materials costs. Include all delivery, handling, insurance costs, etc. On Contractor's letterhead show direct materials costs as follows:

<table>
<thead>
<tr>
<th>Materials</th>
<th>Rate</th>
<th>Quantity</th>
<th>=</th>
<th>Extended Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Line 5. Materials Overhead (Delivery, taxes, insurance, etc.): as mutually agreed upon at contract signing. Enter percentage as applicable. (Spreadsheet calculates the value)

Line 6. Total Contractor's Material Costs: Total of Lines 4 and 5. (Spreadsheet calculates the total)

Line 7. Total Contractor's Equipment Costs: Enter total equipment costs including indirect overhead costs in hourly rate - except indirect labor costs. On Contractor's letterhead show total equipment costs as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Rate</th>
<th>Duration</th>
<th>=</th>
<th>Extended Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Line 8. TOTAL CONTRACTOR'S Labor, Materials & Equipment (L, M & E) Costs: Add Lines 3, 6 and 7 of Part I. (Spreadsheet form calculates totals)

PART II - WORK PERFORMED BY SUBCONTRACTOR:


Line 10. Labor Overhead (Direct Labor Burdens, etc.): Enter percentage (as submitted in Schedule of Values) of Line 9 as applicable. (Spreadsheet calculates the value)

Line 11. Total Contractor's Labor Costs: Total of Lines 9 and 10. (Spreadsheet calculates the total)


Line 13. Materials Overhead (Delivery, taxes, insurance, etc.): Enter percentage as applicable. (Spreadsheet calculates the value)

Line 14. Total Subcontractor's Material Costs: Total of Lines 12 and 13. (Spreadsheet calculates the total)


Line 16. TOTAL SUBCONTRACTOR'S Labor, Materials & Equipment (L, M & E) Costs: Add Lines 11, 14 and 15 of Part II.

Line 17. Subcontractor's Overhead (Indirect costs). Edit percentage of Line 16 if applicable - See Article 35 of General Conditions.

Line 18. Subcontractor's Profit: Enter a "*" in appropriate cell. For an addition, edit E37, a deductible. Edit I37. See Article 35 General Conditions.

Line 19. TOTAL SUBCONTRACTOR'S Labor, Materials & Equipment (L, M & E) Costs: Add Lines 16, 17 and 18 of Part II.

PARTS III THROUGH VIII - CERTIFICATIONS - Self Explanatory.

Part 3. Edit percentages for Line 20 or 21 if applicable. See Article 35 of General Conditions.


Part 4. Line 24. Enter a "*" in appropriate cell. For an addition, edit E45, a deductible. Edit I45. See Article 35 of General Conditions.

Part 5. SUBTOTAL OF CHANGE ORDER PROPOSAL (sum of Lines 8, 19, 22, and 25 - applicable)

Part 6. Contractor's Bond Cost: Enter percentage value of Part 5 as applicable. (Spreadsheet calculates the value)

Part 7. GRAND TOTAL OF THE CHANGE ORDER PROPOSAL. (spreadsheet calculates the sum of parts 5 and 6)

Part 8. Contract time change. Place an "X" in appropriate cell and edit the cell to indicate the number of days changed.

A. The Contractor, who prepares this proposal form, certifies the cost/price data by signing, dating, and forwarding same to the Architect/Engineer (or Consultant) for further action.

B. The Architect/Engineer (or Consultant) reviews and analyzes the cost/price data for the requirements that these are: 1) currently practical, 2) reasonably fair, 3) factually applicable, and 4) equivalently competitive market selling prices. The Architect/Engineer (or Consultant) may negotiate - after receipt of the cost proposal - any or all of the cost elements of the proposal to support a recommendation of acceptance to the Principal Representative. Certification by the A/E (or Consultant) of the above requirements is made upon his signature. The Architect/Engineer (or Consultant) forwards the proposal with the supporting back-up to the Agency.

C. Authority for the Institution or Agency (usually the Principal Representative) reviews the proposal, signs, dates, and forwards to Office of the State Architect for final action.

D. State Buildings Division reviews the cost proposal, with all supporting back-up, for technical and procedural requirements and, if in order, signs and dates the proposal.

SC-6.312 (Rev 7/2018)
SECTION 00 63 58 – CHANGE ORDER LOG

PART 1 - GENERAL

1.1 RELATED ITEMS (Not Applicable)

1.2 SUMMARY (Not Applicable)

1.3 DEFINITIONS (Not Applicable)

1.4 CHANGE ORDER LOG

A. State of Colorado form “Change Order Log”

B. A copy of the above noted form is attached to the end of this section.

1.5 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 63 58
<table>
<thead>
<tr>
<th>CO</th>
<th>COP</th>
<th>COB</th>
<th>INITIATION DATE</th>
<th>INITIATOR</th>
<th>DESCRIPTION</th>
<th>VALUE ADDED</th>
<th>CONT CODE</th>
<th>IMPACT COST</th>
<th>IMPACT TIME</th>
<th>STATUS</th>
<th>REASON FOR CHANGE</th>
<th>RESOLUTION / COMMENT</th>
</tr>
</thead>
</table>

**TOTALS:**

<table>
<thead>
<tr>
<th>COST:</th>
<th>$0</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME:</td>
<td>$0</td>
</tr>
</tbody>
</table>

**Org Contract**

<table>
<thead>
<tr>
<th>New Contract Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.00</td>
</tr>
</tbody>
</table>

**Contingency Codes**

- **DSC** - DIFFERING SITE CONDITIONS: Either encountered on site or in the building structure due to existing conditions not identified or detected during initial investigations.
- **BA** - BID ALTERNATES: Implementation of either additive or deductive bid alternates due to favorable/unfavorable base bid results. The functionality of the project is not compromised by implementation of deductive alternates.
- **AV** - ADDED VALUE: Change work represents essential work necessary to achieve original scope of work but was not identified in the original bid documents due to omission.
- **UPG** - UPGRADES: Change work due to voluntary upgrading by agency/institution of materials and/or equipment/systems within original scope of work. Justification is to be based on durability, energy efficiency, aesthetics, etc.

**Status Codes**

- **OPN** - Open item: has been submitted by Contractor for review by A/E and owner
- **APP** - Approved for processing
- **CLO** - Closed item: COO has been processed or Item canceled
- **SUB** - COP has
SECTION 00 63 63 – CHANGE ORDER

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 CHANGE ORDER

A. State of Colorado form “Change Order” (SC-6.31).

B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 63 63
CHANGE ORDER

Contract ID

Change Order No: ____________________________ No. ____________________________ Date __________

Contractor:

Institution or Agency: University of Colorado Denver

Project No./Name: 21-174017 – CU Denver Building Electrical System Upgrades

Your Change Order Proposal(s), dated _____ is hereby being designated for approval of the following work:

(Note: If more space is needed for description of work, attach additional 8-1/2" x 11" sheets hereeto.)

This change order was originated by the Contractor ☐, Architect/Engineer ☐, State ☐, and I/We do hereby recommend acceptance and approval of the change to the Contractor’s Agreement Dated _____ which is by this reference, made a part hereof, and identified as Exhibit _____ with an increase ☐, a decrease ☐, no change ☐, of $_____.

The Time of Completion is extended _____ calendar days ☐, is unchanged ☐, is reduced ☐ calendar days, from the total number of days listed in the Contractor’s Agreement to complete the entire Project. The revised total number of days to complete the entire Project aggregating this Change Order and previously approved Change Order(s) per the Summary of Changes chart below, is _____ calendar days. If the completion date was extended or reduced, the new completion date of the Project is _____ (M/D/YYYY).

<table>
<thead>
<tr>
<th>SUMMARY OF CHANGES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of Work/Date</td>
</tr>
<tr>
<td>Original Contract</td>
</tr>
<tr>
<td>Change Order #1</td>
</tr>
<tr>
<td>Change Order #2</td>
</tr>
<tr>
<td>Current Totals</td>
</tr>
</tbody>
</table>

State Form SC-6.31
Rev. 7/2010
Page 1 of 2
Persons signing for Architect/Engineer/Contractor hereby swear and affirm that they are authorized to act on Architect/Engineer/Contractor’s behalf and acknowledge that the State is relying on their representations to that effect. Principal is not a recognized title and will not be accepted.

<table>
<thead>
<tr>
<th>Architect/Engineer Firm</th>
<th>Name and Title (print)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td>Signature</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Contractor (Name of Firm)</th>
<th>Name and Title (print)</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>Signature</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Institution or Agency</th>
<th>Name and Title (print)</th>
<th>Principal Representative (Signature)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

**CONTRACT STATUS**

**Original Contract Value**

Previous increases by CO/Amd

Previous decreases by CO/Amd

**Value After Prior CO’s/Amd**

This CO/Amd

Increases □  Decreases □

**CURRENT CONTRACT VALUE**

STATE BUILDINGS PROGRAM (or Authorized Delegate)  DATE

STATE CONTROLLER (or Authorized Delegate)  DATE

(Verification)
SECTION 00 63 64.05 – CONTRACT AMENDMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY

   A. Section includes administrative and procedural requirements for managing the contractual requirements of this Project.

1.3 DEFINITIONS (Not Applicable)

1.4 CHANGE ORDER BULLETIN

   A. State of Colorado form “Contract Amendment” (SC-6.0A).

   B. A copy of the above noted form is attached to the end of this section.

1.5 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 63 64.05
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

CONTRACT AMENDMENT

Amendment No: __________________________  Contract ID No. __________________________
Contractor: ________________________________________________________________
Institution or Agency: University of Colorado Denver
Project No./Name: 21-174017 – CU Denver Building Electrical System Upgrades

PARTIES. THIS AMENDMENT is entered into by and between the STATE OF COLORADO, acting by and through
the ___________________ Principal Representative, hereinafter referred to as the State, and ___________________
having its offices at __________________ hereinafter referred to as the Contractor.

EFFECTIVE DATE AND NOTICE OF NONLIABILITY. This Amendment shall not be effective or enforceable until
it is approved and signed by the State Controller or its designee (hereinafter called the "Effective Date"), but shall
be effective and enforceable thereafter in accordance with its provisions. The State shall not be liable to pay or
reimburse Contractor for any performance hereunder or be bound by any provision hereof prior to the Effective
Date.

FACTUAL RECITALS

Authority exists in the Law and Funds have been budgeted, appropriated, and otherwise made available and a
sufficient unencumbered balance thereof remains available for payment.

Required approval, clearance, and coordination has been accomplished from and with appropriate agencies; and

[Statement of facts/reasons for the Amendment]

NOW THEREFORE, it is hereby agreed that

1. Consideration for this Amendment consists of the payments, which shall be made pursuant to this Amendment
and the promises, and agreements herein set forth.

2. It is expressly agreed by the parties that this Amendment is supplemental to the original Contract, as amended
(_________), collectively referred to as the original Contract, which is incorporated by reference herein, that
all provisions thereof, unless specifically modified herein, apply to this Amendment as though they were
expressly re-written, incorporated, and included herein. (*Note: only use this language if creating Amendment
#2 or higher)

3. It is agreed the original contract is and shall be modified, altered, and changed in the following respects only:

   a.
   b.
   c.
<table>
<thead>
<tr>
<th>Description of Work/Date</th>
<th>Time of Completion/Calendar Days Extended/Reduced</th>
<th>Dollar Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Contract</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amendment #1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Total Amount of Contract (To Date):</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Except with respect to the “Special Provisions,” in the event of any conflict, inconsistency, variance, or contradiction between the provisions of this Amendment and any of the provisions of the original contract, the provisions of this Amendment shall in all respects supersede, govern, and control. The “Special Provisions” shall always be controlling over other provisions in the contract or Amendments. The factual representations in the “Special Provisions” concerning the absence of bribery or corrupt influences and personal interest of State employees are presently reaffirmed.

5. **FINANCIAL OBLIGATIONS OF THE STATE PAYABLE AFTER THE CURRENT FISCAL YEAR ARE CONTINGENT UPON FUNDS FOR THAT PURPOSE BEING APPROPRIATED, BUDGETED, AND OTHERWISE MADE AVAILABLE.**

6. **THIS AMENDMENT SHALL NOT BE DEEMED VALID UNTIL IT SHALL HAVE BEEN APPROVED BY THE CONTROLLER OF THE STATE OF COLORADO OR SUCH ASSISTANT AS SHE OR HE MAY DESIGNATE.**
THE PARTIES HERETO HAVE EXECUTED THIS CONTRACT

Persons signing for Contractor/Consultant hereby swear and affirm that they are authorized to act on Contractor’s behalf and acknowledge that the State is relying on their representations to that effect. Principal is not a recognized title and will not be accepted.

Project Name/Number: __________________________
Contract ID No.: __________________________

THE CONTRACTOR/CONSULTANT: __________________________

Legal Name of Contracting Entity: __________________________

*Signature: __________________________

By: __________________________
Name (print) Title: __________________________

Date: __________________________

STATE OF COLORADO, acting by and through: __________________________
(Insert Name of Agency or IHE)

By: __________________________
(Insert Name & Title of Principal Representative for Agency or IHE)

Date: __________________________

APPROVED
DEPARTMENT OF PERSONNEL & ADMINISTRATION
STATE BUILDINGS PROGRAM
State Architect (or authorized Delegate)

By: __________________________
(Insert Name of Authorized Individual)

Date: __________________________

APPROVED
DEPARTMENT OF LAW
ATTORNEY GENERAL (or authorized Delegate)

By: __________________________
(Insert Name of Authorized Individual)

Date: __________________________

ALL CONTRACTS MUST BE APPROVED BY THE STATE CONTROLLER:

CRS §24-30-202 requires the State Controller to approve all State Contracts. This Contract is not valid until signed and dated below by the State Controller or delegate. Contractor is not authorized to begin performance until such time. If Contractor begins performing prior thereto, the State of Colorado is not obligated to pay Contactor for such performance or for any goods and/or services provided hereunder.

APPROVED:

STATE OF COLORADO
STATE CONTROLLER’S OFFICE
State Controller (or authorized Delegate)

By: __________________________
(Insert Name & Title of Authorized Individual)

Date: __________________________
SECTION 00 65 15 – NOTICE OF PARTIAL SUBSTANTIAL COMPLETION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY

A. Section includes administrative and procedural requirements for managing the contractual requirements of this Project.

1.03 DEFINITIONS (Not Applicable)

1.04 NOTICE OF PARTIAL SUBSTANTIAL COMPLETION

A. State of Colorado form “Notice of Partial Substantial Completion” (SPB-071).

B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 65 15
NOTICE OF PARTIAL SUBSTANTIAL COMPLETION

Date of Partial Substantial Completion:

Institution/Agency: University of Colorado Denver
Project No./Name: 21-174017 – CU Denver Building Electrical System Upgrades

Date to be inserted by the Principal Representative

TO:

Principal Representative

and

Contractor

This is to advise you that the Work has been reviewed, inspected and determined, to the best knowledge, information and belief of the Architect/Engineer, to be substantially complete as of the date noted above in accordance with the criteria outlined in Article 41 of The General Conditions of the Contract in SC-6.23 and SC-8.1 or Article 17.3 in SC-6.4 and the Specifications, including without limitation a) suitable for occupancy, b) inspected for code compliance with Building Inspection Records signed by code officials for the State, c) determined to be fully and comfortably usable, and d) fully cleaned and appropriate for presentation to the public.

A punch list of work to be completed, work not in compliance with the Drawings or Specifications, and unsatisfactory work is attached hereto, along with the Contractor's schedule for the completion of each and every item identified on the punch list specifying the Subcontractor or trade responsible for the work, and the dates the completion or correction will be commenced and finished within any period indicated in the Agreement for punch list completion prior to Final Acceptance.

Except as stated on the reverse side of this Notice of Partial Substantial Completion, all manufacturers' warranties, other special warranties and the Contractor's one-year obligation to perform remedial work, shall commence on the Date of Substantial Completion noted above.

This Notice of Partial Substantial Completion shall be effective and establish the Date of Substantial Completion only when fully executed on the reverse by the Contractor and the Principal Representative. The Principal Representative accepts the Work as substantially complete as of the Date of Substantial Completion herein noted. The Contractor agrees to complete or correct the Work identified on the attached punch list and to do so in accordance with attached punch list completion schedule.

Architect/Engineer Date

Contractor Date

State Buildings Program (or Authorized Delegate) Date

Principal Representative (Institution or Agency) Date
The responsibilities of the Principal Representative and the Contractor for security, maintenance, heat, utilities, and insurance shall be as specified in the Contract Documents or as otherwise hereafter noted:

Exceptions, if any, to the commencement of warranties shall be:

The attached final punch list consists of _____ pages, and the attached Contractor’s schedule showing the dates of commencement and completion of each punch list item consists of _____ pages.

When completely executed, this form shall be sent to the Contractor and the Principal Representative with a copy to State Buildings Program.
SECTION 00 65 16 – NOTICE OF SUBSTANTIAL COMPLETION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY

   A. Section includes administrative and procedural requirements for managing the contractual requirements of this Project.

1.03 DEFINITIONS (Not Applicable)

1.04 CHANGE ORDER BULLETIN

   A. State of Colorado form “Notice of Substantial Completion” (SPB-07).
   
   B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 65 16
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

NOTICE OF SUBSTANTIAL COMPLETION

Date of Substantial Completion: ____________________________

Date to be inserted by the Principal Representative

Institution/Agency: University of Colorado Denver

Project No./Name: 21-174017 – CU Denver Building Electrical System Upgrades

TO:

Principal Representative

and

Contractor

This is to advise you that the Work has been reviewed, inspected and determined, to the best knowledge, information and belief of the Architect/Engineer, to be substantially complete as of the date noted above in accordance with the criteria outlined in Article 41 of The General Conditions of the Contract in SC-6.23 and SC-8.1 or Article 17.3 in SC-6.4 and the Specifications, including without limitation a) suitable for occupancy, b) inspected for code compliance with Building Inspection Records signed by code officials for the State, c) determined to be fully and comfortably usable, and d) fully cleaned and appropriate for presentation to the public.

A punch list of work to be completed, work not in compliance with the Drawings or Specifications, and unsatisfactory work is attached hereto, along with the Contractor’s schedule for the completion of each and every item identified on the punch list specifying the Subcontractor or trade responsible for the work, and the dates the completion or correction will be commenced and finished within any period indicated in the Agreement for punch list completion prior to Final Acceptance.

Except as stated on the reverse side of this Notice of Substantial Completion, all manufacturers’ warranties, other special warranties and the Contractor’s one-year obligation to perform remedial work, shall commence on the Date of Substantial Completion noted above.

This Notice of Substantial Completion shall be effective and establish the Date of Substantial Completion only when fully executed by the Contractor and the Principal Representative. The Principal Representative accepts the Work as substantially complete as of the Date of Substantial Completion herein noted. The Contractor agrees to complete or correct the Work identified on the attached punch list and to do so in accordance with attached punch list completion schedule.

<table>
<thead>
<tr>
<th>Architect/Engineer</th>
<th>Date</th>
<th>Contractor</th>
<th>Date</th>
</tr>
</thead>
</table>

| State Buildings Program (or Authorized Delegate) | Date | Principal Representative (Institution or Agency) | Date |

State Form SPB-07
Rev 7/2012  Page 1 of 2
The responsibilities of the Principal Representative and the Contractor for security, maintenance, heat, utilities, and insurance shall be as specified in the Contract Documents or as otherwise hereafter noted:

Exceptions, if any, to the commencement of warranties shall be:

The attached final punch list consists of ____ pages, and the attached Contractor's schedule showing the dates of commencement and completion of each punch list item consists of ____ pages.

When completely executed, this form shall be sent to the Contractor and the Principal Representative with a copy to State Buildings Program.
SECTION 00 65 19.01 – BUILDING INSPECTION RECORD

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 BUILDING INSPECTION RECORD

A. State of Colorado form "Notice of Substantial Completion" (SBP-BIR).

B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE

A. The University Project Manager will request building permits and provide to Contractor.

B. Permits issued outside of the University jurisdiction are the responsibility of the contractor.

C. Paper copy of the Building Inspection Record (BIR) is required to be kept at the construction site at all times. After final signoff by Building Inspector, return paper copy to University Project Manager. Project Manager is responsible for final signoff on the BIR before the Building Department can close the permit.

D. Contractor is responsible for requesting all University Building Inspector requests through the University’s MyCityInspector website platform.

E. Use the following login page for requesting inspections: https://ucdenver.mycityinspector.com

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 65 19.01
**BUILDING INSPECTION RECORD**

Institution or Agency: University of Colorado Denver  
Project No./Name: 21-174017 – CU Denver Building Electrical System Upgrades

Building Official/Code Review

Agent: ___________________________  
Architect/Engineer: ___________________________  
Contractors:  
- General: ___________________________  
- Electrical: ___________________________  
- Mechanical: ___________________________  
- Plumbing: ___________________________  
Occupancy Classifications: ___________________________

Type of Construction: ___________________________  
Project Manager: ___________________________  
Project Manager Signature: ___________________________

At Completion: ___________________________  
Inspector of Record: ___________________________  
Signature at Completion: ___________________________

Notice to Proceed

Date: ___________________________  
BIR Completion Date: ___________________________

*No work shall be concealed or covered until the appropriate inspector has inspected and approved.*

<table>
<thead>
<tr>
<th>Building (Consultant)</th>
<th>Date</th>
<th>Inspector/ICC#</th>
<th>Comments or Corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Footings/Foundations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Concrete Slab / Under-Floor</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>□ Framing (after rough elec/mech/plumb)</td>
<td></td>
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</tr>
<tr>
<td>□ Lath and Gypsum Board</td>
<td></td>
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</tr>
<tr>
<td>□ Fire-Resistant Penetrations</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>□ Mechanical/Energy Efficiency</td>
<td></td>
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<tr>
<td>□ Roofing</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>□ Other</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>□ Final</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special (Consultant)</th>
<th>Date</th>
<th>Inspector</th>
<th>Comments or Corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Steel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Concrete</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>□ Masonry</td>
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<td></td>
<td></td>
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<tr>
<td>□ Wood</td>
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<tr>
<td>□ Soils/Foundations</td>
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<tr>
<td>□ Spray-Applied Fireproofing</td>
<td></td>
<td></td>
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<tr>
<td>□ Smoke Control Systems</td>
<td></td>
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<tr>
<td>□ Other</td>
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<td></td>
<td></td>
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<tr>
<td>Elevator Inspection (State)</td>
<td>Date</td>
<td>Inspector</td>
<td>Comments or Corrections</td>
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</tr>
<tr>
<td>Final</td>
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<tr>
<td>Electrical (Co. St. Electrical Bd.)</td>
<td>Date</td>
<td>Inspector</td>
<td>Comments or Corrections</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Underground</td>
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<td></td>
</tr>
<tr>
<td>Rough Walls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rough Ceilings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plumbing (Co. Ex. Bd. of Plumbers)</td>
<td>Date</td>
<td>Inspector</td>
<td>Comments or Corrections</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>Underground</td>
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<tr>
<td>Gas</td>
<td></td>
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<td></td>
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<tr>
<td>Inside Water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Department Inspection (Local)</td>
<td>Date</td>
<td>Inspector</td>
<td>Comments or Corrections</td>
</tr>
<tr>
<td>Fire Sprinkler System</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Alarm System</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Dept. Inspection (Local)</td>
<td>Date</td>
<td>Inspector</td>
<td>Comments or Corrections</td>
</tr>
<tr>
<td>Final</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiler Inspection (State)</td>
<td>Date</td>
<td>Inspector</td>
<td>Comments or Corrections</td>
</tr>
<tr>
<td>New Installation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repair or Alteration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Place this card in an obvious, protected location, along with all related inspection reports and documents.
SECTION 00 65 19.03 – NOTICE OF APPROVAL OF OCCUPANCY/USE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)
1.02 SUMMARY (Not Applicable)
1.03 DEFINITIONS (Not Applicable)
1.04 NOTICE OF APPROVAL OF OCCUPANCY/USE
   A. State of Colorado form “Notice of Approval of Occupancy/Use” (SBP-01).
   B. A copy of the above noted form is attached to the end of this section.
1.05 PROCEDURE

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 65 19.03
NOTICE OF APPROVAL OF OCCUPANCY/USE

Date of Occupancy: ____________________________________________________________________

Institution/Agency: University of Colorado Denver

Project No./Name: 21-174017 – CU Denver Building Electrical System Upgrades

Portion(s) of project for which occupancy is approved:

Type of Occupancy: □ Total or □ Partial

The items identified below if applicable must be completed with before Occupancy is approved.

<table>
<thead>
<tr>
<th>Date Completed</th>
<th>A/E Signoff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. The Notice of Substantial Completion has been issued and the Building Inspection Record is completely signed-off and attached.</td>
</tr>
<tr>
<td></td>
<td>2a. Notification has been made to the local Fire Department concerning which portion(s) of the building will be occupied and the date(s).</td>
</tr>
<tr>
<td></td>
<td>2b. Fire alarms, smoke detection systems and building fire sprinkler systems have been fully checked and are operable.</td>
</tr>
<tr>
<td></td>
<td>2c. The building’s fire connections must be installed and operable, if applicable.</td>
</tr>
<tr>
<td></td>
<td>3. Coordination for final utility and service connections and meters (water, gas, sewer, electricity and telecommunication) has been made and systems are in full operating order.</td>
</tr>
<tr>
<td></td>
<td>4. Sterilization of plumbing systems has been performed.</td>
</tr>
<tr>
<td></td>
<td>5. Operational test of systems and equipment has been performed as required.</td>
</tr>
<tr>
<td></td>
<td>6. Systems adjustments such as balancing, equipment operations, etc., have been performed. Reports have been submitted to the Architect/Engineer for approval.</td>
</tr>
<tr>
<td></td>
<td>7. Principal Representative furnished equipment and furnishings are coordinated and placed.</td>
</tr>
<tr>
<td></td>
<td>8. All elements left unfinished must be in such condition that there would be no hazard to the health or safety of the occupants.</td>
</tr>
<tr>
<td></td>
<td>9. All restroom facilities must be fully functional and operable.</td>
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<td></td>
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</tr>
<tr>
<td><strong>10.</strong> All light fixtures must be installed and operable.</td>
<td></td>
</tr>
<tr>
<td><strong>11.</strong> All exit lights and emergency lighting systems have been checked and are operable.</td>
<td></td>
</tr>
<tr>
<td><strong>12.</strong> All windows have been glazed and hardware is available for ventilation purposes.</td>
<td></td>
</tr>
<tr>
<td><strong>13.</strong> All routes of egress must be clear of construction materials and debris at all times.</td>
<td></td>
</tr>
<tr>
<td><strong>14.</strong> There must be a means of pedestrian access to each building. Contractor must have sidewalks installed before occupancy and pedestrian barricades and other means of public protection as required.</td>
<td></td>
</tr>
</tbody>
</table>

Occupancy does not constitute acceptance of the project as being complete. It simply provides the Principal Representative the opportunity to occupy/use the project or the applicable portion thereof prior to final completion and acceptance. Occupants can expect to be impacted by the Contractor’s efforts to complete the project. The Contractor would not repair any damage caused by the occupants.

<table>
<thead>
<tr>
<th>Architect/Engineer</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal Representative (Institution or Agency)</td>
<td>Date</td>
</tr>
<tr>
<td>State Buildings Program (or Authorized Delegate)</td>
<td>Date</td>
</tr>
<tr>
<td>Contractor</td>
<td>Date</td>
</tr>
</tbody>
</table>
SECTION 00 65 19.23 – PRE-ACCEPTANCE CHECKLIST

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)

1.02 SUMMARY (Not Applicable)

1.03 DEFINITIONS (Not Applicable)

1.04 PRE-ACCEPTANCE CHECKLIST
   A. State of Colorado form “Pre-Acceptance Checklist” (SBP-05).
   B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 65 19.23
After Contractor is satisfied that work is complete as per Notice of Substantial Completion Punch List, a date for final review is established. Architect/Engineer inspection is made with Contractor(s) and Principal Representative and State Buildings Programs (SBP) present. Forms are processed as required.

<table>
<thead>
<tr>
<th></th>
<th>DATE COMPLETED</th>
<th>A/E SIGNOFF</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The Notice of Approval of Occupancy/Use has been fully executed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Schedule for corrections, deficiencies, and items to be supplied are established by Contractor.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Final Change Orders are processed (work must be completed prior to Notice of Acceptance).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Punch list work is completed and accepted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Permanent keying, keys and keying instructions have been performed.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Extra materials as per specifications are delivered to Principal Representative.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>As-built drawings have been submitted to Architect/Engineer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Guarantee/Warranty documentation requirements are met.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Five Most Costly Goods form is completed by Contractor and received</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Removal of Contractor’s temporary work including cleanup and debris removal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>State personnel are instructed in system and equipment operations as required by contract.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>All Instructions, manuals, guides, and charts have been transmitted to Principal Representative.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Architect/Engineer</th>
<th>Date</th>
<th>Contractor</th>
<th>Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>State Buildings Programs (or Authorized Delegate)</th>
<th>Date</th>
<th>Principal Representative (Institution or Agency)</th>
<th>Date</th>
</tr>
</thead>
</table>
SECTION 00 65 19.25 – NOTICE OF PARTIAL FINAL ACCEPTANCE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

1.02 SUMMARY

1.03 DEFINITIONS

1.04 NOTICE OF PARTIAL FINAL ACCEPTANCE
   B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 65 19.25
# NOTICE OF PARTIAL FINAL ACCEPTANCE

Date of Notice of Partial Acceptance: 

Institution/Agency: **University of Colorado Denver**

Project No./Name: **21-174017 – CU Denver Building Electrical System Upgrades**

Portion(s) of Project for which final acceptance is approved:

TO:

Notice is hereby given that the State of Colorado, acting by and through the ________________, accepts as complete* the above numbered project.

<table>
<thead>
<tr>
<th>State Buildings Program (or Authorized Delegate)</th>
<th>Date</th>
<th>Principal Representative (Institution or Agency)</th>
<th>Date</th>
</tr>
</thead>
</table>

*When completely executed, this form is to be sent by certified mail to the Contractor by the Principal Representative.
SECTION 00 65 19.26 – NOTICE OF FINAL ACCEPTANCE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS (Not Applicable)
1.02 SUMMARY (Not Applicable)
1.03 DEFINITIONS (Not Applicable)
1.04 NOTICE OF FINAL ACCEPTANCE
   A. State of Colorado form “Notice of Final Acceptance” (SBP-6.27).
   B. A copy of the above noted form is attached to the end of this section.
1.05 PROCEDURE (Not Applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 65 19.26
NOTICE OF FINAL ACCEPTANCE

Date of Notice of Acceptance: ________________________________

Institution/Agency: University of Colorado Denver

Project No./Name: 21-174017 – CU Denver Building Electrical System Upgrades

TO:

Notice is hereby given that the State of Colorado, acting by and through the ______________________________

______, accepts as complete* the above numbered project.

State Buildings Program
(or Authorized Delegate) ________________ Date ________________

Principal Representative
(Institution or Agency) ________________ Date ________________

*When completely executed, this form is to be sent by certified mail to the Contractor by the Principal Representative or delivered by any other means to which the parties agree.
SECTION 00 65 19.30 – NOTICE OF CONTRACTOR’S SETTLEMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

1.02 SUMMARY

1.03 DEFINITIONS

1.04 NOTICE OF CONTRACTOR’S SETTLEMENT
   A. State of Colorado form “Notice of Contractor’s Settlement” (SBP-7.3).
   B. A copy of the above noted form is attached to the end of this section.

1.05 PROCEDURE

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 65 19.30
STATE OF COLORADO
OFFICE OF THE STATE ARCHITECT
STATE BUILDINGS PROGRAM

NOTICE OF CONTRACTOR’S SETTLEMENT

Institution/Agency: University of Colorado Denver
Notice Number: 
Project No./Title: 21-174017 – CU Denver Building Electrical System Upgrades

Notice is hereby given that on __________ at ________________, Colorado, final settlement will be made by the STATE OF COLORADO with ________________________________, hereinafter called the "CONTRACTOR", for and on account of the contract for the construction of a PROJECT as referenced above.

1. Any person, co-partnership, association or corporation who has an unpaid claim against the said project, for or on account of the furnishing of labor, materials, team hire, sustenance, provisions, provender, rental machinery, tools, or equipment and other supplies used or consumed by such Contractor or any of his subcontractors in or about the performance of said work, may at any time up to and including said time of such final settlement, file a verified statement of the amount due and unpaid on account of such claim.

2. All such claims shall be filed with the Authority for College, Institution, Department or Agency.

3. Failure on the part of a creditor to file such statement prior to such final settlement will relieve the State of Colorado from any and all liability for such claim.

Authorized Facility Manager or Authorized Individual

Name: _______________________________
Approval Date: _______________________
Agency: ______________________________
Phone: _______________________________
Fax: _________________________________
Email: _______________________________

MEDIA OF PUBLICATION:

PUBLICATION DATES:
First:
Second: (At least ten (10) days prior to above settlement date)

NOTES TO EDITOR:

Transmit two (2) copies of the Affidavit of Publication, and invoice, to:
SECTION 00 73 00 – CONSTRUCTION PURCHASE ORDER TERMS AND CONDITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY

A. Section includes administrative and procedural requirements for managing the contractual requirements of this Project.

1.3 DEFINITIONS (Not Applicable)

1.4 CONSTRUCTION PURCHASE ORDER TERMS AND CONDITIONS

A. A. The University of Colorado Denver | Anschutz Medical Campus Construction Purchase Order Terms and Conditions apply to Contractors Agreement (D/B/B) (SC-6.21) and General Conditions to the Contract (SC-6.23).

B. A copy of the above noted document is attached to the end of this section.

1.5 PROCEDURE (Not applicable)

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 00 73 00
Facilities Management
Construction Purchase Order Terms and Conditions

1. Offer/Acceptance

If this purchase order ("PO") refers to vendor's bid or proposal, this PO is an ACCEPTANCE of vendor's OFFER TO SELL in accordance with the terms and conditions of the "solicitation" identified in vendor's bid or proposal. The solicitation includes an RFP, IFB, or any other form of order by the University. If a bid or proposal is not referenced, this PO is an OFFER TO BUY, subject to vendor's acceptance, demonstrated by vendor's performance or written acceptance of this PO. Any COUNTER-OFFER TO SELL automatically CANCELS this PO, unless a change order is issued by the University accepting a counter-offer. This PO shall supersede and control over any vendor form(s) or part(s) thereof included in or attached to any bid, proposal, offer, acknowledgment, or otherwise, in the event of inconsistencies or contradictions, regardless of any statement to the contrary in such form(s) or parts thereof.

2. Safety Information

All chemicals, equipment and materials proposed and/or used in the performance of this PO shall conform to the requirements of the Occupational Safety and Health Act of 1970. Vendor shall furnish all Material Safety Data Sheets (MSDS) for any regulated chemicals, equipment or hazardous materials at the time of delivery.

3. Changes

Vendor shall furnish products and/or services strictly in accordance with the specifications and price set forth for each item. This PO shall not be modified, superseded or otherwise altered, except in writing signed by purchasing agent and accepted by vendor. Each shipment received or service performed shall comply with the terms of this PO, notwithstanding invoice terms or acts of vendor to the contrary, unless this PO has been modified, superseded or otherwise altered in accordance with this section.

4. Delivery

Unless otherwise specified in the solicitation or this PO, delivery shall be FOB destination. The University is relying on the promised delivery date, installation, and/or service performance set forth in vendor's bid or proposal as material and basic to the University's acceptance. If vendor fails to deliver or perform as and when promised, the University in its sole discretion, may cancel its order, or any part thereof, without prejudice to its other rights, return all or part of any shipment so made, and charge vendor with any loss or expense sustained as a result of such failure to deliver or perform as promised. Time is of the essence.

5. Intellectual Property

Any software, research, reports, studies, data, photographs, negatives or other documents, drawings or materials (collectively "materials") delivered by vendor in performance of its obligations under this PO shall be the exclusive property of the University. Ownership rights shall include, but not be limited to, the right to copy, publish, display, transfer, prepare derivative works, or otherwise use the materials. Vendor shall comply with all applicable laws, regulations and University policies related to confidential information and all confidentiality and non-disclosure agreements, security controls, and reporting requirements.
6. Quality

The University shall be the sole judge in determining "equals" with regard to quality, price and performance. All products delivered shall be newly manufactured and the current model, unless otherwise specified.

7. Warranties

All provisions and remedies of the Colorado Uniform Commercial Code, CRS, Title 4 ("CUCC"), relating to implied and/or express warranties are incorporated herein, in addition to any warranties contained in this PO or the specifications.

8. Inspections and Acceptance

Final acceptance is contingent upon completion of all applicable inspection procedures. If products or services fail to meet any inspection requirements, the University may exercise all of its rights, including those provided in the CUCC. The University shall have the right to inspect services provided under this PO at all reasonable times and places. "Services" as used in this section includes services performed or tangible material produced or delivered in the performance of services. If any of the services do not conform to PO requirements, the University may require vendor to perform the services again in conformity with PO requirements, without additional payment. When defects in the quality or quantity of service cannot be corrected by re-performance, the University may (a) require vendor to take necessary action to ensure that future performance conforms to PO requirements and (b) equitably reduce the payment due vendor to reflect the reduced value of the services performed. These remedies do not limit the remedies otherwise available in this PO, at law, or in equity.

9. Cash Discount

The cash discount period will start from the later of the date of receipt of acceptable invoice, or from date of receipt of acceptable products/services at the specified destination by an authorized University representative.

10. Taxes

The University is exempt from all federal excise taxes under Chapter 32 of the Internal Revenue Code and from all State and local government sales and use taxes [CRS, Title 39, Article 26, Parts I and II].

11. Payment

The University shall pay vendor for all amounts due within 30 days after receipt of products or services and a correct notice of amount due. Interest on the unpaid balance shall begin to accrue on the 46th day at the applicable statutory rate. Interest shall not accrue if a good faith dispute exists as to the University's obligation to pay all or a portion of the amount due. Vendor shall invoice the University separately for interest on delinquent amounts due, referencing the delinquent payment, number of day's interest to be paid, and applicable interest rate.

12. Vendor Offset

[Not Applicable to Inter-governmental POs] The University may withhold payment as required under the State vendor offset intercept system for debts owed for: (a) unpaid child support debts or arrearages; (b) unpaid balances of tax, accrued interest, or other charges specified in CRS § 39-21-101, et seq.; (c) unpaid loans due to the Student Loan Division of the Department of Higher Education; (d) amounts required to be paid to the Unemployment Compensation Fund; and (e) other unpaid debts owing to the University.
13. Assignment and Successors

Vendor shall not assign rights or delegate duties under this PO, or subcontract any part of the performance required under this PO, without the express, written consent of the University. This PO shall inure to the benefit of and be binding upon vendor and the University and their respective successors and assigns. Assignment of accounts receivable may be made only upon written notice furnished to the University.

14. Indemnification

If any article sold or delivered under this PO is covered by a patent, copyright, trademark, or application therefore, vendor shall indemnify and hold harmless the University from any and all loss, liability, cost, expenses and legal fees incurred on account of any claims, legal actions or judgments arising out of manufacture, sale or use of such article in violation or infringement of rights under such patent, copyright, trademark or application. If this PO is for services, vendor shall indemnify, save, and hold harmless the University, its employees and agents, against any and all claims, damages, liability and court awards including costs, expenses, and attorney fees and related expenses, incurred as a result of any act or omission by vendor, or its employees, agents, subcontractors or assignees, arising out of or in connection with performance of services under this PO.

15. Independent Contractor

Vendor shall perform its duties hereunder as an independent contractor and not as an employee. Neither vendor nor any agent or employee of vendor shall be deemed to be an agent or employee of the University. Vendor and its employees and agents are not entitled to unemployment insurance or workers compensation benefits through the University and the University shall not pay for or otherwise provide such coverage for vendor or any of its agents or employees. Unemployment insurance benefits will be available to vendor and its employees and agents only if coverage is made available by vendor or a third party. Vendor shall pay when due all applicable employment, income, and local head taxes incurred pursuant to this PO. Vendor shall not have authorization, express or implied, to bind the University to any agreement, liability or understanding. Vendor shall (a) provide and keep in force workers’ compensation and unemployment compensation insurance in the amounts required by law, (b) provide proof thereof when requested by the University, and (c) be solely responsible for its acts and those of its employees and agents.

16. Communication

All communication concerning administration of this PO, prepared by vendor for the University’s use, shall be furnished solely to purchasing agent.

17. Compliance

Vendor shall strictly comply with all applicable federal and state laws, rules, and regulations in effect or hereafter established, including, without limitation, laws applicable to discrimination and unfair employment practices.

18. Insurance

Vendor shall obtain, and maintain, at all times during the term of this PO, insurance as specified in the solicitation, and provide proof of such coverage as requested by the University’s purchasing agent.
19. Termination Prior to Shipment

If vendor has not accepted this PO in writing, the University may cancel this PO by written or oral notice to vendor prior to shipment of goods or commencement of services.

20. Termination for Cause

(a) If vendor refuses or fails to timely and properly perform any of its obligations under this PO with such diligence as will ensure its completion within the time specified herein, the University may notify vendor in writing of non-performance and, if not corrected by vendor within the time specified in the notice, terminate vendor's right to proceed with the PO or such part thereof as to which there has been delay or a failure. Vendor shall continue performance of this PO to the extent not terminated and be liable for excess costs incurred by the University in procuring similar goods or services elsewhere. Payment for completed services performed and accepted shall be at the price set forth in this PO. (b) The University may withhold amounts due to vendor as the University deems necessary to reimburse the University for excess costs incurred in curing, completing or procuring similar goods and services. (c) If after rejection, revocation, or other termination of vendor's right to proceed under the CUCC or this clause, the University determines for any reason that vendor was not in default or the delay was excusable, the rights and obligations of the University and vendor shall be the same as if the notice of termination had been issued pursuant to termination under § 21.

21. Termination in Public Interest

The University is entering into this PO for the purpose of carrying out the public policy of the State and University, as determined by the Governor, General Assembly and Courts of the State of Colorado and the University of Colorado Board of Regents. If this PO ceases to further the public policy of the State or University, the University, in its sole discretion, may terminate this PO in whole or in part and such termination shall not be deemed to be a breach of the University’s obligations hereunder. This section shall not apply to a termination for vendor's breach, which shall be governed by Item 20 (Termination for Cause). The University shall give written notice of termination to vendor specifying the part of the PO terminated and when termination becomes effective. Upon receipt of notice of termination, vendor shall not incur further obligations except as necessary to mitigate costs of performance. For services or specially manufactured goods, the University shall pay (a) reasonable settlement expenses, (b) the PO price or rate for supplies and services delivered and accepted, (c) reasonable costs of performance on unaccepted supplies and services, and (d) a reasonable profit for the unaccepted work. For existing goods, the University shall pay (e) reasonable settlement expenses, (f) the PO price for goods delivered and accepted, (g) reasonable costs incurred in preparation for delivery of the undelivered goods, and (h) a reasonable profit for the preparatory work. The University's termination liability under this section shall not exceed the total PO price plus a reasonable cost for settlement expenses. Vendor shall submit a termination proposal and reasonable supporting documentation, and cost and pricing data as required by CRS § 24-106-101, upon request of the University.

22. PO Approval

This PO shall not be valid unless it is executed by purchasing agent. The University shall not be responsible or liable for products or services delivered or performed prior to proper execution hereof.

23. Fund Availability

Financial obligations of the University payable after the current fiscal year are contingent upon funds for that purpose being budgeted and otherwise made available. If this PO is funded in whole or in part with federal funds, this PO is subject to and contingent upon the continuing availability of federal funds for the purposes hereof. The University represents that it has set aside sufficient funds to make payment for goods delivered in a single installment, in accordance with the terms of this PO.
24. Choice of Law

Colorado laws, rules and regulations shall be applied in the interpretation, execution, and enforcement of this PO. The CUCC shall govern this PO in the case of goods unless otherwise agreed in this PO. Any provision included or incorporated herein by reference which conflicts with such laws, rules, and regulations is null and void. Any provision incorporated herein by reference which purports to negate this or any other provision in this PO in whole or in part shall not be valid or enforceable or available in any action at law, whether by way of complaint, defense, or otherwise. Unless otherwise specified in the solicitation or this PO, venue for any judicial or administrative action arising out of or in connection with this PO shall be in Denver, Colorado. Vendor shall exhaust administrative remedies in CRS § 24-109-106, prior to commencing any judicial action against the University.

25. Sensitive Data

To the extent vendors come in contact with individual personal data owned or otherwise held by the University including employee, student, or medical information or records as a result of performing under this PO (“Data”), vendor agrees to use such Data, if at all, only to the extent required to perform its obligations under this PO, and to abide by the requirements of any federal, state and local laws that address the protection and/or use of such Data.

26. Background Checks

Contractor acknowledges that Contractor’s activities may involve heightened risks as a result of access or exposure by Contractor’s employees or agents to one or more Sensitive Environments. Contractor expressly acknowledges that Contractor shall take all commercially reasonable measures to mitigate any such risks, which measures may include but are not limited to conducting criminal history checks, financial background checks, or reference checks on employees or agents who will have access to one or more Sensitive Environments. For purposes of this provision, Sensitive Environment means any situation where Contractor’s employees or agents: (a) are engaged in supervision of or exposure to minors or other vulnerable populations; (b) have access to confidential information, which includes any information protected or restricted by law or University policy or that is expressly identified by the University as confidential information; (c) have access to the University’s information technology systems; (d) are engaged in activities that involve unique or specialized risks.

27. Public Contracts for Service

[Not Applicable to offer, issuance, or sale of securities, investment advisory services, fund management services, sponsored projects, intergovernmental POs, or information technology services or products and services] Vendor certifies, warrants, and agrees that it does not knowingly employ or contract with an illegal alien who will perform work under this PO and will confirm the employment eligibility of all employees who are newly hired for employment in the United States to perform work under this PO, through participation in the E-Verify Program or the Department program established pursuant to CRS § 8-17.5-102(5)(c), Vendor shall not knowingly employ or contract with an illegal alien to perform work under this PO or enter into a contract or PO with a subcontractor that fails to certify to vendor that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this PO. Vendor shall (a) not use E-Verify Program or Department program procedures to undertake pre-employment screening of job applicants during performance of this PO, (b) notify subcontractor and the University within three days if vendor has actual knowledge that subcontractor is employing or contracting with an illegal alien for work under this PO, (c) terminate the subcontract if subcontractor does not stop employing or contracting with the illegal alien within three days of receiving notice, and (d) comply with reasonable requests made in the course of an investigation, undertaken pursuant to CRS § 8-17.5-102(5), by the Colorado Department of Labor and Employment. If vendor participates in the Department program, vendor shall deliver to the University a written, notarized affirmation that vendor has examined the legal work status of such employee, and shall comply with all of the other requirements of the Department program. If vendor fails to comply with any requirement of this provision or CRS § 8-17.5-101...
et seq., the University may terminate this PO for breach and, if so terminated, vendor shall be liable for damages.

28. Public Contracts with Natural Persons

Vendor, if a natural person eighteen (18) years of age or older, hereby swears and affirms under penalty of perjury that he or she (a) is a citizen or otherwise lawfully present in the United States pursuant to federal law, (b) shall comply with the provisions of CRS § 24-76.5-101 et seq., and (c) has produced a form of identification required by CRS § 24-76.5-103 prior to the date vendor delivers goods or begins performing services under terms of the PO.

29. Governmental Immunity.

No term or condition of this contract shall be construed or interpreted as a waiver, express or implied, of any of the immunities, rights, benefits, protections, or other provisions, of the Colorado Governmental Immunity Act, CRS §24-10-101 et seq., or the Federal Tort Claims Act, 28 U.S.C. §§1346(b) and 2671 et seq., as applicable now or hereafter amended.


The signatories aver that to their knowledge, no employee of the University has any personal or beneficial interest whatsoever in the service or property described in this contract. Contractor has no interest and shall not acquire any interest, direct or indirect, that would conflict in any manner or degree with the performance of Contractor’s services and Contractor shall not employ any person having such known interests.

31. Federal Flowdown Provisions for Federally Funded Contracts

The University of Colorado has entered into an Agreement with either the U.S. Government, or another entity who has itself entered into an Agreement with the U.S. Government. That Agreement requires that certain federal contract provisions be made a part of any subsequent Purchase Order issued by the University of Colorado related to furthering the performance or deliverables required under that Agreement.

Where necessary to make the context of these provisions applicable to this order, the term "contractor" shall mean "seller," the term "contract" shall mean "this order," and the terms "Government," "contracting officer," and equivalent phrases shall mean "the University." Seller hereby agrees to flowdown the applicable clauses to its lower-tier subcontractors, and agrees that the clauses are in effect between it and the University, as applicable.

The following provisions are from the Federal Acquisition Regulations (FAR), which are available online. (NOTE: These FAR clauses may have applicability only when the Purchase Order is at or in excess of a certain dollar threshold, shown in parentheses, or under certain circumstances.)

<table>
<thead>
<tr>
<th>FAR Citation</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>52.203-6</td>
<td>Restrictions on Subcontractor Sales to the Government ($100,000)</td>
</tr>
<tr>
<td>52.203-7</td>
<td>Anti-Kickback Procedures except Subparagraph (c)(1) ($100,000)</td>
</tr>
<tr>
<td>52.203-12</td>
<td>Limitation on Payments to Influence Certain Federal Transactions ($100,000)</td>
</tr>
<tr>
<td>52.204-2</td>
<td>Security Requirements (applicable if access to classified material is involved) ($0)</td>
</tr>
<tr>
<td>52.215-2</td>
<td>Audit and Records -- Negotiation ($100,000)</td>
</tr>
<tr>
<td>FAR Citation</td>
<td>Title</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>52.215-10</td>
<td>Price Reduction for Defective Cost or Pricing Data ($550,000)</td>
</tr>
<tr>
<td>52.215-12</td>
<td>Subcontractor Cost or Pricing Data ($550,000)</td>
</tr>
<tr>
<td>52.215-13</td>
<td>Subcontractor Cost or Pricing Data -- Modifications ($550,000)</td>
</tr>
<tr>
<td>52.215-14</td>
<td>Integrity of Unit Prices ($100,000)</td>
</tr>
<tr>
<td>52.219-8</td>
<td>Utilization of Small Business Concerns ($100,000)</td>
</tr>
<tr>
<td>52.219-9</td>
<td>Small Business and Small Disadvantaged Business Subcontracting Plans (Large Businesses) ($650,000)</td>
</tr>
<tr>
<td>52.219-16</td>
<td>Liquidated Damages -- Subcontracting Plan ($650,000)</td>
</tr>
<tr>
<td>52.222-4</td>
<td>Contract Work Hours and Safety Standards Act -- Overtime Compensation ($100,000)</td>
</tr>
<tr>
<td>52.222-21</td>
<td>Prohibition of Segregated Facilities ($10,000)</td>
</tr>
<tr>
<td>52.222-26</td>
<td>Equal Opportunity ($10,000)</td>
</tr>
<tr>
<td>52.222-35</td>
<td>Affirmative Action for Disabled Veterans and Veterans of the Vietnam Era ($25,000)</td>
</tr>
<tr>
<td>52.222-36</td>
<td>Affirmative Action for Workers with Disabilities ($10,000)</td>
</tr>
<tr>
<td>52.222-37</td>
<td>Employment Reports on Disabled Veterans and Veterans of the Vietnam Era ($25,000)</td>
</tr>
<tr>
<td>52.223-2</td>
<td>Clean Air and Water (applicable on orders issued under contracts solicited and issued prior to February 25, 2000)</td>
</tr>
<tr>
<td>52.223-6</td>
<td>Drug-Free Workplace (for individuals, $0; for non-individuals, $100,000)</td>
</tr>
<tr>
<td>52.223-7</td>
<td>Notice of Radioactive Materials (applicable if radioactive materials are involved) ($0)</td>
</tr>
<tr>
<td>52.223-14</td>
<td>Toxic Chemical Release Reporting ($100,000; N/A for acquisition of commercial items)</td>
</tr>
<tr>
<td>52.224-2</td>
<td>Privacy Act (applicable if vendor is supplying design, development, or operation of a system of records on individuals) ($0)</td>
</tr>
<tr>
<td>52.225-3</td>
<td>Buy American Act - Free Trade Agreements - Israeli Trade Act ($0)</td>
</tr>
<tr>
<td>52.225-13</td>
<td>Restrictions on Certain Foreign Purchases ($2,500)</td>
</tr>
<tr>
<td>52.226-1</td>
<td>Utilization of Indian Organizations and Indian-Owned Economic Enterprises ($0)</td>
</tr>
<tr>
<td>52.227-1</td>
<td>Authorization and Consent (applicable if in excess of the simplified acquisition threshold)</td>
</tr>
<tr>
<td>52.227-2</td>
<td>Notice and Assistance Regarding Patent and Copyright Infringement (applicable if in excess of the simplified acquisition threshold)</td>
</tr>
<tr>
<td>52.227-10</td>
<td>Filing of Patent Applications -- Classified Subject Matter ($0)</td>
</tr>
<tr>
<td>52.227-11</td>
<td>Patent Rights -- Retention by the Contractor (Short Form) ($0)</td>
</tr>
<tr>
<td>52.227-14</td>
<td>Rights in Data - General ($0)</td>
</tr>
<tr>
<td>52.230-5</td>
<td>Cost Accounting Standards -- Educational Institutions ($500,000)</td>
</tr>
<tr>
<td>FAR Citation</td>
<td>Title</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>52.230-6</td>
<td>Administration of Cost Accounting Standards ($500,000)</td>
</tr>
<tr>
<td>52.244-6</td>
<td>Subcontract for Commercial Items and Commercial Components ($0; non-commercial supplies or services)</td>
</tr>
<tr>
<td>52.245-5</td>
<td>Government Property (Cost Reimbursement, Time-and-Materials, or Labor-Hour Contracts) (paragraph &quot;g&quot; Limited risk of loss is not applicable) ($0)</td>
</tr>
<tr>
<td>52.247-63</td>
<td>Preference for U.S.-Flag Air Carriers ($100,000)</td>
</tr>
<tr>
<td>52.247-64</td>
<td>Preference for Privately Owned U.S.-Flag Commercial Vessels ($0)</td>
</tr>
</tbody>
</table>

In addition, if federal funds through a contract from an agency of the Department of Defense are involved, the following Department of Defense Federal Acquisition Regulations (DFAR) clauses apply. DFAR clauses are available online.

(Note: These DFAR clauses may have applicability only when the Purchase Order is at or in excess of a certain dollar threshold, shown in parentheses, or under certain circumstances.)

<table>
<thead>
<tr>
<th>DFAR Citation</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>252.203-7001</td>
<td>Prohibition on Persons Convicted of fraud or Other Defense-Contract Related Felonies (not applicable for commercial items) (applicable if at or in excess of the simplified acquisition threshold)</td>
</tr>
<tr>
<td>252.209-7000</td>
<td>Acquisition from Subcontractors Subject to On-Site Inspection Under the Intermediate Range Nuclear Forces (INF) Treaty (applicable if at or in excess of the simplified acquisition threshold) (not applicable for commercial items)</td>
</tr>
<tr>
<td>252.227-7013</td>
<td>Rights in Technical Data – Noncommercial Items ($0)</td>
</tr>
<tr>
<td>252.227-7014</td>
<td>Rights in Noncommercial Computer Software and Noncommercial Computer Software Documentation</td>
</tr>
<tr>
<td>252.227-7034</td>
<td>Patents - Subcontracts ($0, for experimental, developmental, or research work to be performed by other than a small business firm or non-profit organization)</td>
</tr>
<tr>
<td>252.231-7000</td>
<td>Supplemental Cost Principles ($0)</td>
</tr>
</tbody>
</table>

In addition, if federal funds through a contract from the National Aeronautic and Space Administration (NASA) are involved, the following NASA Supplemental Federal Acquisition Regulations (FAR) clauses apply. NASA clauses are available online.

(Note: These NASA clauses may have applicability only when the Purchase Order is at or in excess of a certain dollar threshold, shown in parentheses, or under certain circumstances.)

<table>
<thead>
<tr>
<th>NASA Citation</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1852.208-81</td>
<td>Restrictions on Printing and Duplicating, Oct 2001 ($0)</td>
</tr>
<tr>
<td>1852.219-74</td>
<td>Use of Rural Area Small Businesses, Sept 1990 ($0)</td>
</tr>
<tr>
<td>1852.219-75</td>
<td>Small Business Subcontracting Reporting, May 1999 ($500,000)</td>
</tr>
<tr>
<td>1852.223-70</td>
<td>Safety and Health, April 2002 (1) Amount to $1,000,000 or more (unless Contracting Officer makes a written determination, after consultation with installation safety and health representatives, that this is not required); (2)</td>
</tr>
</tbody>
</table>
30. Federal Flowdown Provisions for Federally Funded Grants

The University of Colorado has entered into an Agreement with either the U.S. Government, or another entity who has itself entered into an Agreement with the U.S. Government. That Agreement requires that certain federal grant provisions be made a part of any subsequent Purchase Order issued by the University of Colorado related to furthering the performance or deliverables required under that Agreement.

Where necessary to make the context of these provisions applicable to this order, the term "contractor" shall mean "seller," the term "contract" shall mean "this order," and the terms "Government," "contracting officer," and equivalent phrases shall mean "the University." Seller hereby agrees to flowdown the applicable clauses to its lower-tier subcontractors, and agrees that the clauses are in effect between it and the University, as applicable.

Performance by the seller under this Purchase Order constitutes certification that the seller is presently in compliance with, and will continue to comply with, the Byrd Anti-Lobbying Amendment (31 U.S.C. 1352) and Executive Orders Numbers 12549 and 12689, all as described below.

Equal Employment Opportunity


All contracts and subgrants in excess of $2000 for construction or repair awarded by recipients and subrecipients shall include a provision for compliance with the Copeland "Anti-Kickback" Act (18 U.S.C. 874), as supplemented by Department of Labor regulations (29 CFR part 3, "Contractors and Subcontractors on Public Building or Public Work Financed in Whole or in Part by Loans or Grants from the United States"). The Act provides that each contractor or subrecipient shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public work, to give up any part of the compensation to which he is otherwise entitled. The recipient shall report all suspected or reported violations to the Federal awarding agency.

Davis-Bacon Act, as amended (40 U.S.C. 276a to a-7)

When required by Federal program legislation, all construction contracts awarded by the recipients and subrecipients of more than $2000 shall include a provision for compliance with the Davis-Bacon Act (40 U.S.C. 276a to a-7) and as supplemented by Department of Labor regulations (29 CFR part 5, "Labor Standards Provisions Applicable to Contracts Governing Federally Financed and Assisted Construction").
Under this Act, contractors shall be required to pay wages to laborers and mechanics at a rate not less than the minimum wages specified in a wage determination made by the Secretary of Labor. In addition, contractors shall be required to pay wages not less than once a week. The recipient shall place a copy of the current prevailing wage determination issued by the Department of Labor in each solicitation and the award of a contract shall be conditioned upon the acceptance of the wage determination. The recipient shall report all suspected or reported violations to the Federal awarding agency.

**Contract Work Hours and Safety Standards Act (40 U.S.C. 327-333)**

Where applicable, all contracts awarded by recipients in excess of $2000 for construction contracts and in excess of $2500 for other contracts that involve the employment of mechanics or laborers shall include a provision for compliance with Sections 102 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-333), as supplemented by Department of Labor regulations (29 CFR part 5). Under Section 102 of the Act, each contractor shall be required to compute the wages of every mechanic and laborer on the basis of a standard work week of 40 hours. Work in excess of the standard work week is permissible provided that the worker is compensated at a rate of not less than 1 1/2 times the basic rate of pay for all hours worked in excess of 40 hours in the work week. Section 107 of the Act is applicable to construction work and provides that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous or dangerous. These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence.

**Rights to Inventions Made Under a Contract or Agreement**

Contracts or agreements for the performance of experimental, developmental, or research work shall provide for the rights of the Federal Government and the recipient in any resulting invention in accordance with 37 CFR part 401, "Rights to Inventions made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations issued by the awarding agency.

**Clean Air Act (42 U.S.C. 7401 et seq.) and the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.), as amended**

Contracts and subgrants of amounts in excess of $100,000 shall contain a provision that requires the recipient to agree to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401 et seq.) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251 et seq.). Violations shall be reported to the Federal awarding agency and the Regional Office of the Environmental Protection Agency (EPA).


Contractors who apply or bid for an award of $100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant or any other award covered by 31 U.S.C. 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient.

**Debarment and Suspension (E.O.s 12549 and 12689)**

No contract shall be made to parties listed on the General Services Administration's List of Parties Excluded from Federal Procurement or Nonprocurement Programs in accordance with E.O.s 12549 and
12689, "Debarment and Suspension." This list contains the names of parties debarred, suspended, or otherwise excluded by agencies, and contracts declared ineligible under statutory or regulatory authority other than E.O. 12549. Contractors with awards that exceed the small purchase threshold shall provide the required certification regarding its exclusion status and that of its principal employees.

Access to Records (OMB Circular A-110, .48(d))

All negotiated contracts (except those for less than the small purchase threshold) awarded by recipients shall include a provision to the effect that the recipient, the Federal awarding agency, the Comptroller General of the United States, or any of their duly authorized representatives, shall have access to any books, documents, papers, and records of the contractor which are directly pertinent to a specific program for the purpose of making audits, examination, excerpts and transcriptions.

31. Security Badging

All costs and time associated with obtaining a University security badge for Contractor employees working on campus shall be borne by the Contractor.
SECTION 01 00 00 - GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Design Requirements:
   1. Designer Responsibility: Based on a series of meetings with the University Project Manager and applicable University staff, draft Division 01 Specification Sections consistent with State of Colorado Construction Contract provisions, General and Supplementary Conditions of the Contract, including requirements for administrative procedures consistent with the size and scope of the project.
   2. Content: Include, as applicable, the following Sections:
      a. SECTION 01 00 00 – SUMMARY.
      b. SECTION 01 18 00 – PROJECT UTILITY SOURCES.
      c. SECTION 01 23 00 – ALTERNATES.
      d. SECTION 01 25 00 – SUBSTITUTION PROCEDURES.
      e. SECTION 01 26 00 – CONTRACT MODIFICATION PROCEDURES.
      f. SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION.
      g. SECTION 01 32 33 – PHOTOGRAPHIC DOCUMENTATION.
      h. SECTION 01 33 00 – SUBMITTAL PROCEDURES.
      i. SECTION 01 35 00 – SPECIAL PROCEDURES.
         1) This Section includes special environment health and safety procedures unique to work at University projects.
      j. SECTION 01 35 46 – INDOOR AIR QUALITY PROCEDURES
         1) This Section includes special procedures required by the University to maintain a high level of indoor air quality both during construction and subsequent to occupancy.
      k. SECTION 01 40 00 – QUALITY REQUIREMENTS.
      l. SECTION 01 41 00 – REGULATORY REQUIREMENTS.
      m. SECTION 01 42 00 – REFERENCES.
      n. SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS.
      o. SECTION 01 60 00 – PRODUCT REQUIREMENTS.
      p. SECTION 01 73 00 – CLOSEOUT PROCEDURES.
      q. SECTION 01 74 19 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
      r. SECTION 01 78 23 – OPERATION AND MAINTENANCE DATA.
      s. SECTION 01 78 39 – PROJECT RECORD DOCUMENTS.
      t. SECTION 01 78 46 – EXTRA STOCK MATERIALS.
      u. SECTION 01 79 00 – DEMONSTRATION AND TRAINING.
      v. SECTION 01 81 13 – SUSTAINABLE DESIGN REQUIREMENTS.
      w. SECTION 01 91 13 – GENERAL COMMISSIONING REQUIREMENTS.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 00 00
SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Project information.
2. Work covered by Contract Documents.
3. Work by University.
4. Work under separate contracts.
5. University-furnished and installed products.
7. Access to site.
8. Coordination with occupants.
10. Specification and drawing conventions.

B. Related Requirements:
1. Section 01 35 46 "Indoor Air Quality Procedures" for requirements and procedures related to maintaining air quality in adjacent occupied spaces and buildings.
2. Section 01 50 00 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of University's facilities and for the provision of temporary construction barriers and dust partitions.

1.3 PROJECT INFORMATION

   1. Project Location: 1250 14th St, Denver, CO 80202.

B. Principal Representation: University of Colorado Denver.
   1. University's Representative: Michael Barden, 303.921.0415, michael.barden@cuanschutz.edu


D. Engineer's Consultants: The Engineer has retained the following design professionals who have prepared designated portions of the Contract Documents:

E. The Work of Project is defined by the Contract Documents and, in summary, briefly consists of the following:
1. The main scope of the project consists of replacing the existing electrical panels throughout the building.

1.4 WORK BY UNIVERSITY

A. General: Cooperate fully with University so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by University. Coordinate the Work of this Contract with work performed by University.

1.5 WORK UNDER SEPARATE CONTRACTS

A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

1.6 ACCESS TO SITE

A. General: Contractor shall have limited and restricted use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
   1. Adjust means and methods of construction based on site limits and restrictions.
   2. Locate staging areas only where permitted by University.
   3. As part of this Project, replace damaged lawns, sprinkler systems, sidewalks and any other existing site improvements within staging area and access ways.

C. Construction Access and Travel:
   1. Use only those entrances, exits, and travel ways on campus roads and within the building designated by University. Contractor's personnel are not permitted in non-designated areas of University's existing facilities. Use only designated travel ways for transporting demolition materials, new construction materials, tools and equipment.
   2. Use of other than designated travel ways on campus roads and within existing buildings requires a minimum of 20 business days prior approval by University.
      a. Request variations to traffic flow including temporary fire lane, parking lot, sidewalk and road closures, regulatory signage, and traffic control devices in accordance with City and County of Denver requirements.
   3. Access to the site will be as permitted by the University. Prearrange delivery and use of cranes, heavy trucks and other heavy equipment at least 72 hours prior to need through the University's Project Manager and University Police.
   4. Maintain access to fire lanes and campus operations at all times. Provide flag personnel during the ingress or egress of large equipment.
      a. When fire lanes and/or access way must be temporarily disrupted notify University Police and University Parking and Transportation at least 20 business days in advance and reconfirm 72 hours in advance through the University's Project Manager.
   5. Arrange for and obtain all necessary permits from City and County of Denver for any disruption to or temporary closures of public city streets. Coordinate procurement of permits with University Project Manager.

D. Construction Parking:
1. General: Contractor parking will not be provided; make arrangements and pay for all required parking.
2. Provide temporary parking or use designated areas of University's existing parking areas as applicable to the Project and in accordance with the following:
   a. All parking on University property, including parking on University owned streets, is under the exclusive control and authority of University Parking and Transportation Services.
   b. There is no free parking on campus. Displacement or use of existing parking spaces by Contractor, either for parking or for staging, is a Contractor cost.
   c. Use of existing parking spaces or other areas outside of Contractor’s staging area must be approved in advance by University Parking and Transportation Services.
   d. University Parking and Transportation Services may require and issue parking permits through the University Project Manager. Permits must be displayed and visible at all times while parked on the campus. Failure to display a permit will result in citations being written and possible removal of the vehicle from University property.
   e. Keep all designated parking areas clean and free of litter and debris. University reserves the right to direct Contractor to clean areas not kept clean and orderly.
   f. University Parking and Transportation Services may change parking assignments as deemed necessary, restrict the use of any space(s) or lot(s) at any time, and determine the hours of control and mode of operations for any parking area at any time. University Parking and Transportation Services may deny or revoke parking privileges to any person when deemed necessary and/or considered to be in the best interests of the University.
3. Parking on University property is at the Contractor’s own risk. The University and any entity affiliated with it are not responsible for fire, theft, and damage to or loss of contractor’s or subcontractor’s vehicle or any article left therein. Only a license is granted to the user and no bailment is created.

E. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.7 COORDINATION WITH OCCUPANTS

A. University may occupy site and both existing and adjacent building(s) during entire construction period. Cooperate with University during construction and sequence operations to minimize conflicts and facilitate University usage. Perform the Work so as not to interfere with University's day-to-day operations.
   1. Maintain existing exits from existing and adjacent building, unless otherwise indicated.
   2. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from University and approval of authorities having jurisdiction.
   3. Limit construction operations to those methods and procedures which will not adversely and unduly affect the working environment of University's occupied spaces, including noise, dust, odors, air pollution, ambient discomfort, poor lighting, hazards and other undesirable effects and conditions.
   4. Coordinate with University Project Manager to schedule jack hammering or activities producing dusty conditions, excessive fumes or odors during off-hours.
   5. When work must be accomplished in areas containing existing furniture, upon a minimum of 3 business days notification of the University Project Manager, University will remove or relocate existing furniture.
6. Provide not less than 72 hours' notice to University Project Manager of activities that will affect University's operations. University Project Manager will coordinate with campus tenants.
   a. Refer to “Work Restrictions” Article of this Section for procedures and notification requirements related to utility interruptions.
7. Provide temporary barriers and partitions, or other means as required to protect occupants of existing building and the general public from injury due to construction activities. Prevent the spread of dust and dirt to adjacent occupied areas and building.

1.8 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
   2. In planning and executing the Work, take into consideration the special needs of University patient care, teaching and research settings, for example, supply of critical utilities, noise and dust control, access to existing loading docks, occupied buildings, etc.

B. Normal Working Hours: Limit work to normal working hours of 7:00 a.m. to 7:00 p.m., Monday through Friday.
   1. Notify University Project Manager of all proposed work outside of normal working hours. Include dates, times, names and contact information for contractors and subcontractor performing the Work with notification. University Project Manager will notify, as appropriate, other University personnel and departments including, but not limited to, Building Maintenance and Operations (BMO) Directors, BMO assigned representative, Campus Police and Facilities Management.

C. Noise and Vibration: Coordinate operations that may result in high levels of noise and vibration, or other disruption to University occupancy with University.
   1. Noise during Normal Working Hours: Identify potentially disruptive construction activities at weekly Progress Meeting and adjust active time of day to reduce significant impacts on occupants.
   2. Noise outside Normal Working Hours: Schedule construction work or demolition work outside of normal working hours with University Project Manager at minimum of 24 hours in advance.
      a. The maximum permissible noise level is 75 decibels (dBA), measured at the adjacent property line.

D. Contractor Identification:
   1. Supervisory staff for the primary contractor must obtain an identification badge at the University Anschutz Medical Center (AMC) Building 500. Submit the University Access Control Badge Application form through University Project Manager. Submitted forms shall be complete with all required information including a letter on company letterhead confirming employee status with company and stating whether the company completes background testing and/or drug screening. Contractor supervision must display badge on site during construction activities.
   2. To the greatest extent possible, Contractor's and subcontractor's employees must wear a recognizable logo shirt or hardhat identifying them as members of the contractor's work force.
   3. Work with University Project Manager and Building Maintenance and Operations staff to get identification badge activated.
   4. Work with University Project Manager and Building Maintenance and Operations staff to set up identification badge for access to construction areas secured by card reader.
E. Use of Existing Elevators: Use "freight" elevators only and protect finishes during transport. Elevators may not be used for transport of construction materials between 7:00am – 9:00am, 11:30am – 1:30pm, and from 3:00pm – 5:00pm.
1. Do not block corridors, aisles, passageways or doors leading to elevator except as, and only to the extent approved by University Project Manager.

F. Keys: Submit written request to University Project Manager on University Key Request Form.
1. To the extent the need for keys is demonstrated and required to complete the Work, University Project Manager will issue keys to Contractor.
2. Contractor is responsible for all costs related to lost or non-returned keys.
3. Electrical, mechanical and sensitive research space may require University escort in lieu of issuing keys.

G. Dock Deliveries: Notify University Project Manager and limit deliver time to a maximum of 20 minutes.

H. Existing Utility Interruptions: Do not interrupt water, sewer, plumbing, gas, steam, chilled water, oxygen, HVAC, electrical power, lighting, telephone and other related utilities serving facilities occupied by University without prior notice to and approval by the University. Coordinate and schedule interruptions in advance through the University Project Manager in strict conformance with University Utility Interruption/Outage Request Procedure.
1. Form of Notice: University Utility Interruption and Start-up Request form.
2. Time of Notice: Notice for major and minor outages as defined by the Utility Interruption/Outage Request Procedure is 8 business days for minor outages and 31 business days for major outages.

I. Fire Alarm and Fire Sprinkler Interruptions: When construction activities require interruption of fire alarm or fire sprinkler service, or when dust from construction activities is likely to cause accidental alarm, advise University Project Manager who will submit an interruption request.
1. Form of Notice: University Fire Alarm/Sprinkler Disable Request Form.
2. Time of Notice: Prior to noon on the day before the anticipated interruption.

J. Nonsmoking Campus: Smoking, chewing tobacco, and other related tobacco product use is not permitted at any location on campus except outside in designated areas.

K. University Policies Applying to All Contractors: Comply with University policies applying to contractors including drug policy, sexual harassment policy and tobacco free policy. Obtain copies of University policies from University Project Manager.
1. Controlled Substances: Use of tobacco products and other controlled substances on Project site and surrounding Campus is not permitted.

L. Designated Eating Areas: Restrict consumption of food on project site to designated eating areas as approved by University Project Manager.

1.9 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
3. Words in the singular number include the plural and those in the plural include the singular.
4. Words of any gender include any other gender.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products may be identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00
SECTION 01 18 00 - PROJECT UTILITY SOURCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes matrix of utility sources applicable to Project.

1.3 QUALITY ASSURANCE

A. Comply with utility company and regulatory agency codes, standards, and guidelines for the provision of new or extension of exiting utilities.

1.4 UTILITY SOURCE MATRIX

A. The following matrix summarizes utility responsible for provision of utility service:
SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if University decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.

2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

3. Selection of alternates described in this Section may be deferred for possible selection at a subsequent date if so indicated in the Agreement.

1.4 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated revisions to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.
D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

1. Alternate descriptions are recognized as abbreviated and incomplete. Correlate the descriptions with applicable Specification Sections and Drawings for the provision of complete and coordinated work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Deduct Alternate No. 1: Panelboard and Transformers.
   1. Base Bid: Replace the panelboards and transformers as indicated on sheets E0.10 Electrical Demolition One-line Diagram and E0.11 Electrical New One-line Diagram.
   2. Deduct Alternate: Leave the existing panelboards and transformers as indicated on sheets E0.10 Electrical Demolition One-line Diagram and E0.11 Electrical New One-line Diagram in lieu of replacing them.

B. Deduct Alternate No. 2: P1 Garage Transformer and Panelboard.
   1. Base Bid: furnish and install new 30kVA transformer and panelboard within the P1 Garage Pump Room to be fed from existing panel H1F as indicated on sheet E2.01 Overall Electrical Plan – Level P1.
   2. Deduct Alternate: Do not provide or install a new 30kVA transformer and new panelboard LB1 within the P1 Garage Pump Room as indicated on sheets E2.01 Overall Electrical Plan – Level P1.

C. Deduct Alternate No. 3: 4th Floor Woodshop Transformer and Panelboard.
   2. Deduct Alternate: Do not provide or install the new transformers T-L4C, T-D4 and new panelboards L4B1, L4B2, L4C, L4D and L4D1 as indicated on sheet E2.40 Overall Electrical Plan – Level 4.

END OF SECTION 01 23 00
SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:
   1. Section 01 21 00 "Allowances" for products selected under an allowance, if applicable.
   2. Section 01 23 00 "Alternates" for products selected under an alternate, if applicable.
   3. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
   1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
   2. Substitutions for Convenience: Changes proposed by Contractor or University that are not required in order to meet other Project requirements but may offer advantage to Contractor or University.

1.4 ACTION SUBMITTALS

A. Substitution Requests: Submit each request for consideration in format and quantities specified in Section 01 33 00 "Submittal Procedures". Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: Use CSI Form 13.1A or Contractor-generated form with substantially the same information.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
      a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by University and separate contractors that will be necessary to accommodate proposed substitution.

c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

e. Samples, where applicable or requested.

f. Certificates and qualification data, where applicable or requested.

g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.

h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.

i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.

j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

k. Cost information, including a proposal of change, if any, in the Contract Sum.

l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.

m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect/Engineer's Action: If necessary, Architect/Engineer in consultation with the University will request additional information or documentation for evaluation within seven calendar days of receipt of a request for substitution. Architect/Engineer in consultation with the University will notify Contractor of acceptance or rejection of proposed substitution within 14 calendar days of receipt of request, or seven calendar days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order.

b. Use product specified if Architect/Engineer does not issue a decision on use of a proposed substitution within time allocated.
1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 14 calendar days prior to time required for preparation and review of related submittals.

1. Conditions: Architect/Engineer in consultation with the University will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect/Engineer will return requests without action, except to record noncompliance with these requirements:
   a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
   b. Requested substitution provides sustainable design characteristics that specified product provided.
   c. Substitution request is fully documented and properly submitted.
   d. Requested substitution will not adversely affect Contractor's construction schedule.
   e. Requested substitution has received necessary approvals of authorities having jurisdiction.
   f. Requested substitution is compatible with other portions of the Work.
   g. Requested substitution has been coordinated with other portions of the Work.
   h. Requested substitution provides specified warranty.
   i. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00
SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Requirements:
   1. Section 01 25 00 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.
   2. [Contractor’s Agreement Design/Bid/Build, State Form SC-6.21 and The General Conditions of the Construction Contract Design/Bid/Build, State Form SC-6.23] [Construction Manager/General Contractor Agreement CMGC, State Form SC-6.4] [Design/Build Agreement, State Form SC-8.0 and The General Conditions of the Design/Build Agreement, State Form SC-8.1] for definitions and contractual requirements related to contract modification procedures.

1.3 DEFINITIONS

A. Change Order: A written order in compliance with the requirements of the Contract authorizing changes in the Work. For the purposes of this Section a Change Order and a Contract Amendment shall have the same meaning.

1.4 INFORMATIONAL SUBMITTALS

A. Contractor’s Authorized Signatory: Submit name of individual authorized to accept changes and responsible for informing others employed by Contractor of changes in the Work.

1.5 MINOR CHANGES IN THE WORK

A. Architect/Engineer will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.
1.6 CHANGE ORDER BULLETIN

A. University-Initiated Change Order Bulletin: Architect/Engineer will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications. It will also state the time period for which the request will remain valid.
2. Work Change Order Bulletins issued by Architect/Engineer are not instructions either to stop work in progress or to execute the proposed change.

B. Contractor-Initiated Change Order Bulletin: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect/Engineer.
2. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.

1.7 CHANGE ORDER PROPOSAL

A. Change Order Proposal: In response to a University-Initiated Change Order Bulletin or accompanying a Contractor-Initiated Change Order Bulletin, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change described.
2. Labor Rates: Prior to submitting first Change Order Proposal, submit bare, unburdened hourly labor rates for all contractor and subcontractor labor categories; submit itemized breakdown of all applicable additional labor benefit costs to be added to the bare labor cost to arrive at the total burdened hourly labor cost.
3. Equipment Costs: Provide cost backup for all equipment clearly indicating equipment billing rates and sufficient to demonstrate, as determined by the University Project Manager, that proposed rates are competitive and reasonable in all cases. Submit completed Change Order Proposal Form within the requested timeframe. Include backup documentation to support calculations consistent with Contract provisions, including but not limited to, the following:
   a. Contractor and Subcontractor labor, material and equipment costs including:
      1) A list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
      2) Applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
      3) Costs of labor and supervision directly attributable to the change and as permitted by the terms and conditions of the General Contract for Construction.
b. Contractor and Subcontractor overhead and profit.
c. Contractor's bond cost.
d. Justification for Change in Contract Time: An updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

4. Maintain detailed records of work completed. Provide complete information for evaluation of proposed changes and to substantiate proposed changes in Contract Sum or Contract Time.

1.8 ADMINISTRATIVE CHANGE ORDERS

A. Allowance Adjustment: See Section 01 21 00 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.

B. Unit-Price Adjustment: See Section 01 22 00 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.9 CHANGE ORDER PROCEDURES

A. Submit three signed copies of Change Order Proposal to Architect/Engineer for review.
   1. University-Initiated Change Order Bulletins: University and Architect/Engineer will evaluate Contractor’s Change Order Proposal and either request additional information or suggest modifications. Based on this review and evaluation University will either accept or reject the proposal.
   2. Contractor-Initiated Change Order Bulletins: Architect/Engineer will evaluate Contractor’s claim based on the terms and conditions of the Contractor Agreement and General Conditions of the Construction Contract, as applicable.
   3. Architect/Engineer’s Action: When satisfied as to the accuracy and completeness of the Change Order Proposal, the Architect/Engineer will sign all three copies and forward to the University for consideration.

B. On University's approval of a Change Order Proposal, Architect/Engineer will prepare, sign and forward three copies of a Change Order, State Form SC-6.31 available from the website of the Office of the State Architect, for signature by the Contractor. Contractor then forwards all three copies of signed Change Order to the University for signature and distribution of fully executed copies to Architect/Engineer and Contractor for record.

C. Upon receipt of a fully executed Change Order, promptly perform the following:
   1. Revise Schedule of Values on the Application for Payment Form by indicating each authorized Change Order as a separate line item and adjusting the Contract Sum as shown on the Change Order.
      a. University will not pay for changes to the Work until authorized by a Change Order signed by all parties.
   2. Revise the Progress Schedule to reflect any change in the Contract Time.
3. Enter changes in the Project Record Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00
SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Requirements:
   1. Section 01 21 00 "Allowances" for procedural requirements governing the handling and processing of allowances.
   2. Section 01 22 00 "Unit Prices" for administrative requirements governing the use of unit prices.
   3. Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
   4. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
   5. For projects required to obtain LEED certification, Division 01 Section "Sustainable Design Requirements" for administrative requirements governing submittal of cost breakdown information required for LEED documentation.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. Schedule of values report from cost-loaded Critical Path Method Schedule prepared in accordance with Section 01 32 00 “Construction Progress Documentation” may serve to satisfy requirements for the schedule of values.
   1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
      a. Application for Payment forms with continuation sheets.
      b. Submittal schedule.
      c. Items required to be indicated as separate activities in Contractor's construction schedule.
1) Construction Manager’s Fee.
2) Estimated Project General Conditions Costs.

2. Submit schedule of values and hold a conference with the Architect/Engineer and University Project Manager to finalize the schedule of values at earliest possible date, but no later than 10 business days before the date scheduled for submittal of initial Certificates and Applications for Payment.

3. Subschedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work, provide subschedules showing values coordinated with each element.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:
   a. Project name and location.
   b. Name of Architect/Engineer.
   c. Architect/Engineer's project number.
   d. Contractor's name and address.
   e. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.

3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
   a. Related Specification Section or Division.
   b. Description of the Work.
   c. Name of subcontractor.
   d. Name of manufacturer or fabricator.
   e. Name of supplier.
   f. Change Orders (numbers) that affect value.
   g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
      1) Labor.
      2) Materials.
      3) Equipment.

   a. Include separate line items under Contractor and principal subcontractors for LEED documentation, where applicable, and other Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.

5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.

7. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
a. Temporary facilities and other major cost items that are not a direct cost of actual work-in-place shall be shown as separate line items in the schedule of values.

8. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect/Engineer and paid for by University.
   1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Pay Application and Schedule Review Meetings: Conduct in accordance with Section 01 31 00 “Project Management and Coordination.” Provide draft application for payment and draft schedule update reflecting work accomplished during previous pay period. Review progress achieved; discuss and resolve issues affecting the progress; and review critical activities to be accomplished during the following 90 calendar days.
   1. Jobsite Walk: When required, conduct a walk of the jobsite to confirm progress related to any activity in question.

C. Monthly Schedule Reporting: Upon conclusion of the Pay Application and Schedule Review Meeting, but not later than the 28th of the month, update the Construction Schedule and submit the Pay Application.

D. Payment Application Times: Submit Application for Payment to Architect/Engineer by the first day of the month and no more than five (5) business days prior thereto. The period covered by each Application for Payment is per the date indicated in the Application.

E. Payment Application Review: The Architect/Engineer shall, within five (5) business days after the receipt of each Certificate and Application for Payment, review the Project Application for Payment and either execute a Project Certificate for Payment to the University or notify the Contractor in writing of the reasons for withholding a Certificate.
   1. All applications for payment, except the final application, and the payments there under, shall be subject to correction in the next application rendered following the discovery of any error

F. Application for Payment Forms: Use State Form SBP-7.2 “Certification for Contractor Payment.”

G. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect/Engineer will return incomplete applications without action.
   1. Entries shall match data on the schedule of values and Contractor’s construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.

3. Include amounts of Change Orders issued before last day of construction period covered by application.

4. Indicate separate amounts for work being carried out under University-requested project acceleration.

H. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site as approved in advance by the University Project Manager and items stored at an off-site location previously agreed upon in writing.

1. Provide certificate of insurance, evidence of transfer of title to University, and consent of surety to payment, for stored materials.

2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.

3. Provide summary documentation for stored materials indicating the following:
   a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
   b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
   c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.

I. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect/Engineer by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.

2. Schedule of values.

3. For projects required to obtain LEED certification, LEED submittal for project materials cost data.

4. Contractor's construction schedule (preliminary if not final).

5. Products list (preliminary if not final).

6. For projects required to obtain LEED certification, LEED action plans.

7. Schedule of unit prices.

8. Submittal schedule (preliminary if not final).

9. List of Contractor's staff assignments.

10. List of Contractor's principal consultants.


13. Initial progress report.

K. Application for Payment at Substantial Completion: After Architect/Engineer issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificate(s) of Substantial Completion issued previously for University occupancy of designated portions of the Work.

L. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. All items on Pre-acceptance Checklist (State Form SBP-05) have been completed.
2. Notice of Acceptance (State Form SBP-6.27) has been issued.
3. Statements to support local sales tax refunds, if any submitted.
4. Notice of Contractor’s settlement has been published.
5. Evidence of completion of Project closeout requirements, including but not limited to:
   a. Submittal of Record Documents.
   b. Submittal of all Operation and Maintenance Manuals.
   c. Completion of all required demonstration and training.
6. Updated final statement, accounting for final changes to the Contract Sum.
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when University took possession of and assumed responsibility for corresponding elements of the Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00
SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
   1. General coordination procedures.
   2. Coordination drawings.
   3. Requests for Information (RFIs).
   4. Project Web site.
   5. Project meetings.

B. Related Requirements:
   1. Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
   2. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
   3. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

A. RFI: Request from Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Within 21 calendar days of Notice of Award submit, as complete as possible, a preliminary list to include all major subcontractors. Augment, complete and submit the final subcontractor list within 60 calendar days of Notice of Award, unless a longer duration is approved by the Architect/Engineer. Include the following information in tabular form:
   1. Name, address, and telephone number of entity performing subcontract or supplying products.
   2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 14 calendar days after Notice to Proceed, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, [on Project Web site,] and by each temporary telephone. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

A. General: Each entity involved in the performance of work for the entire Project shall cooperate in the overall coordination of the Work; promptly, when requested, furnish information concerning its portion of the Work; and respond promptly and reasonably to the decisions and requests of persons designated with coordination, supervision, administrative or similar authority.

1. University Standard Project Management Forms
   a. Where applicable, obtain from the University Project Manager and use the following University Standard Forms:
      1) Preconstruction Agenda
      2) Change Order Log with Contingency Codes
      3) Access Control Badge Application Form
      4) Utility Interruption Request Form
      5) Utility Start-Up Request Form
      6) Fire Alarm/Sprinkler Disable Request Form
      7) Hot Work Permit Form
      8) Anschutz Medical Campus (AMC) Street and Parking Lot Closure Form
      9) Indoor Air Quality (IAQ) Planning Checklist
      10) Indoor Air Quality (IAQ) Inspection Checklist

2. Site Utilization:
   a. In addition to the site utilization limitations and requirements indicated in Section 01 10 00 “Summary” and indicated by the Contract Documents; administer the allocation of available space equitably among entities needing access and space, so as to produce the best overall efficiency in the performance of the total work of the project. Schedule deliveries so as to minimize the space and time requirements for storage of materials and equipment on the site; but do not unduly risk delays in the work.
   b. Concurrent work of the Contractor, other contractors, suppliers, and the University personnel may be working in relatively close proximity. The Contractor is solely responsible for coordinating their work with that of other contractors and will make no claims for failure to do so.

3. Layout:
   a. It is recognized that the Contract Documents are diagrammatic in showing certain physical relationships of the various elements and systems and their interfacing with other elements and systems. Establishment and coordination of these relationships is the exclusive responsibility of the Contractor. Do not scale the drawings. Lay out and arrange all elements to
contribute to safety, efficiency and to carry the harmony of design throughout the Work. In case of conflict or undimensioned locations, verify required positioning with Architect/Engineer.

4. Substrate Examination:
   a. The installer of each element of the work must examine the conditions of the substrate to receive the work, dimensions and spaces adjacent, tolerances, interfacing with other elements and services, and the conditions under which the work will be performed, and must notify the Contractor in writing of conditions detrimental to the proper or timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

5. Large and Heavy Equipment:
   a. Contractor to coordinate with University Project Manager requirements to be maintained for the subsequent entry of large equipment units. Coordinate the movement of heavy items with shoring and bracing, so that the building structure will not be overloaded during the movement and installation.
   b. Where equipment or products to be installed on the roof are too heavy to be hand-carried, do not transport across roof deck; position by crane or other device so as to avoid overloading the roof deck.

B. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections of the Specification that depend on each other for proper installation, connection, and operation.
   1. Contractor Communication with the University: Direct all communication with the University through the University Project Manager.
   2. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
   3. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
   4. Make adequate provisions to accommodate items scheduled for later installation.

C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for University and separate contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's construction schedule.
   2. Preparation of the schedule of values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Preinstallation conferences.
   7. Project closeout activities.
8. Startup and adjustment of systems.

E. Coordination Of Submittals: Prior to transmittal to the Architect/Engineer, review shop and erection drawings, product data, and samples for compliance with Contract Documents and for coordination among work of all Sections of the Specifications. Coordination of submittals shall include, but not be limited to the following:
   1. Verification of field dimensions and clearances and relationship to available space and anchors.
   2. Verification of compatibility with equipment and work of other Sections, electrical characteristics, and operational control requirements.
   3. Verification of motor voltages and control characteristics.
   4. Coordination of controls, interlocks, wiring of pneumatic switches, and relays.
   5. Coordination of wiring and control diagrams.
   6. Review of the effect of any changes on work of other Sections.
   7. For any item to be installed in or on a finished surface, certify that applicable Contract Documents have been checked and that the item submitted is compatible with the surface finish on which it is to be installed.
   8. Equipment and material submittals shall show sufficient data to indicate complete compliance with Contract Documents as follows:
      a. Proper sizes and capabilities.
      b. Ability to fit in the available space in a manner that will allow proper service.
      c. Construction methods, materials, and finishes.
      d. List of accessories.

F. Special Coordination Requirements for Mechanical and Electrical Work:
   1. General: Provide necessary work and services required to coordinate the complete installation of heating, ventilating, and air conditioning (HVAC) equipment and systems; plumbing systems and fixtures; electrical equipment, fixtures, and systems; and other equipment or systems containing motors and controls or requiring connection to mechanical or electrical systems; all so that the various systems perform as indicated and are in harmony with other project Work.
   2. Contract Drawings:
      a. Drawings are schematic in nature, and indicate in general how the various components are integrated with other parts of the building. Coordinate exact locations by job measurement, by verifying the requirements of other trades, and by review of Contract Documents.
   3. Mechanical and Electrical Drawings indicate general routing of the various parts of the systems, but do not indicate all sizes, fittings, offsets, and runouts which are required. Coordinate correct sizes, fittings, offsets, and runouts required to fit systems into allocated spaces. Coordinate locations of all light fixtures, vents, and supply grilles to conform to the ceiling grid system or other modular finishes.
   4. Coordinate installation of mechanical and electrical work in compliance with the following requirements:
      a. Install piping, ductwork and similar services straight and true, aligned with other work, close to walls and overhead structure, allowing for insulation, concealed (except where indicated as exposed) in occupied spaces, and out-of-the-way with maximum passageway and headroom remaining in each space.
b. Install electrical work in a neat, organized manner with conduit and similar services in or parallel with building lines, and concealed unless indicated as exposed.

c. For all work maintain maximum practical overhead clearance but not less than 6” above ceiling. Where exposed, maintain 7’-0” minimum clearance.

d. Arrange all work to facilitate maintenance and repair or replacement of equipment. Locate services requiring maintenance on valves and similar units in front of services requiring less maintenance. Connect equipment for ease of disconnecting, with minimum of interference with other work.

e. Provide space to permit removal of coils, tubes, fan shafts, filters, other parts which may require replacement.

f. Locate operating and control equipment and devices for easy access. Furnish access panels where units are concealed by finishes and similar work.

g. Integrate mechanical work in ceiling plenums with suspension system, light fixtures and other work, so that required performances of each will be achieved.

h. Give the right-of-way to piping systems required to slope for drainage over other service lines and ductwork.

i. Advise other trades of openings required in their work for accommodation of mechanical and electrical elements. Provide and place sleeves and anchors required in other work.

5. Access to Equipment: Except where located above accessible ceilings, provide access panels wherever access is required to concealed valves, controls, dampers, pull boxes and other devices requiring ongoing or periodic access.

a. Acceptable types of access panels are specified in Division 08.

b. Each trade is responsible for providing access panels needed for access to their equipment and coordinating installation with other Division 03, 04, 06 and 09 trades.

c. Coordinate requirements and obtain approval of locations from Architect/Engineer.

G. Compatibility of Systems:

1. Provide products and equipment which are compatible with other work requiring mechanical/electrical interface including electrical connections, control devices, water, drain and other piping connections. Verify electrical characteristics, fuel requirements and other interface requirements before ordering equipment and resolve conflicts that may arise.

2. Coordinate equipment, mechanical and electrical work in accordance with the following schedule:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>FURNISHED BY</th>
<th>MOUNTED BY</th>
<th>LOW VOLTAGE WIRED BY</th>
<th>POWER WIRED &amp; CONNECTED BY</th>
<th>LOW VOLTAGE CONTROL CONNECTED BY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment motors</td>
<td>I</td>
<td>MI</td>
<td>MI</td>
<td>EI</td>
<td>--</td>
</tr>
</tbody>
</table>

Project Management and Coordination
<table>
<thead>
<tr>
<th>Equipment Description</th>
<th>MI</th>
<th>EI</th>
<th>EI</th>
<th>EI</th>
<th>MI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor starters, contactors and overload heaters</td>
<td>MI</td>
<td>EI</td>
<td>EI</td>
<td>EI</td>
<td>MI</td>
</tr>
<tr>
<td>Fused and unfused disconnect switches</td>
<td>EI**</td>
<td>EI**</td>
<td>EI**</td>
<td>EI</td>
<td>--</td>
</tr>
<tr>
<td>Manual operating switches, speed switches, push-button stations and pilot lights</td>
<td>MI</td>
<td>EI</td>
<td>EI</td>
<td>EI</td>
<td>EI</td>
</tr>
<tr>
<td>Duct detectors</td>
<td>EI</td>
<td>MI</td>
<td>MI</td>
<td>EI</td>
<td>MI</td>
</tr>
<tr>
<td>Control relays and transformers</td>
<td>MI</td>
<td>MI</td>
<td>MI</td>
<td>EI</td>
<td>MI</td>
</tr>
<tr>
<td>Thermostats, time switches*</td>
<td>MI</td>
<td>MI</td>
<td>MI</td>
<td>EI</td>
<td>MI</td>
</tr>
<tr>
<td>Temperature control panels</td>
<td>MI</td>
<td>MI</td>
<td>MI</td>
<td>EI</td>
<td>MI</td>
</tr>
<tr>
<td>Motor and solenoid valves, damper motors, PE and EP switches</td>
<td>MI</td>
<td>MI</td>
<td>MI</td>
<td>--</td>
<td>MI</td>
</tr>
<tr>
<td>Refrigeration equipment, cooling tower and controls</td>
<td>MI</td>
<td>MI</td>
<td>MI</td>
<td>EI</td>
<td>MI</td>
</tr>
<tr>
<td>Electric meters</td>
<td>EI</td>
<td>EI</td>
<td>EI</td>
<td>EI</td>
<td>MI</td>
</tr>
<tr>
<td>Steam meters</td>
<td>MI</td>
<td>MI</td>
<td>MI</td>
<td>MI</td>
<td>MI</td>
</tr>
</tbody>
</table>
I. Special Coordination Requirements for Exterior Envelope Work:
   1. General: Provide necessary work and services required to coordinate the complete and continuous installation of the building’s heat, air and moisture barriers. Exterior building envelope construction to be coordinated includes, but is not limited to, below-grade walls, slabs-on-grade, exterior opaque walls, windows, curtain walls, roofs, and skylights.
   2. Contract Drawings:
      a. Drawings indicate general concepts and design intent for continuity of heat, air and moisture barriers at each exterior building envelope component and at transitions between building envelope components. Coordinate details for continuity based on actual product selections and Contractor’s proposed sequence of construction.

J. Complete Systems:
   1. It is the intent of the Contract Documents that all systems, including mechanical and electrical, be complete and functional to provide the intended or specified performance. Provide all incidental items and parts necessary to achieve this requirement.
   2. Provide correctly sized power, utilities, piping, drains, services and their connections to equipment and systems requiring them, whether or not specific
items are listed in the schedule under “Compatibility of Systems” paragraph in this Section.

K. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
   1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as University's property.
   2. Establish recycling program at job site. Refer to Section 01 74 19 “Construction Waste Management and Disposal” for additional requirements.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
   1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
      a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
      b. Coordinate the addition of trade-specific information to the coordination drawings by multiple subcontractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
      c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
      d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
      e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
      f. Indicate required installation sequences.
      g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect/Engineer indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:
   1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings, where required, to adequately represent the Work.
   2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components...
within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.

3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.

4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.

5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.

6. Mechanical and Plumbing Work: Show the following:
   a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
   b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
   c. Fire-rated enclosures around ductwork.

7. Electrical Work: Show the following:
   a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
   b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
   c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
   d. Location of pull boxes and junction boxes, dimensioned from column center lines.

8. Fire-Protection System: Show the following:
   a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.

9. Windows, Curtain Wall, and Exterior Wall Assembly Transition Work: Show all components of each adjacent wall or window system and all required compatible tie-ins between them including transition strips, flashings and sealants. Clearly identify each product, its configuration and its extent. Shop Drawings which only generically indicate adjacent construction and/or indicate "construction by others" will not be acceptable.

10. Review: Architect/Engineer will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect/Engineer determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect/Engineer will so inform Contractor, who shall make changes as directed and resubmit.

11. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 01 33 00 "Submittal Procedures."

C. Virtual Design and Construction (VDC), Building Information Model (BIM) and Coordination Digital Data Files:
1. General: It is expected that, to the greatest extent applicable, Contractor will employ VDC and BIM tools to facilitate the construction, coordination, scheduling and phasing of the Work.

2. Contractor's VDC implementation shall include at a minimum the following activities:
a. Development and maintenance of a three-dimensional building information model (BIM) of the Work that includes contractor-developed, shop-drawing level information of the following building components and systems:
   1) Building structure, including but not limited to, foundations, columns, beams, joists, purlins, floor and roof decking and fill, bracing, and load-bearing walls.
   2) HVAC systems, including but not limited to, HVAC piping and pumps, air distribution ductwork, fans, air terminal units, air outlets and inlets; central cooling equipment compressors, chillers, condensers, and cooling towers; boilers, heat exchangers and packaged and/or custom air-handling units and thermal storage systems.
   3) Plumbing systems, including but not limited to, water distribution, storm drainage and sanitary sewerage waste and vent piping, water-heaters and plumbing fixtures.
   4) Fire suppression systems, including but not limited to, standpipes, sprinkler systems, fire pumps, and non-water-based fire-extinguishing systems.
   5) Electrical systems, including but not limited to, conduit greater than 1-1/2 inches in diameter, or bundled conduits, cable-tray, transformers, switchgear, switchboards, panelboards, generators, lightning protection and lighting.
   6) Communication systems, including but not limited to, structured cabling, premise wiring distribution system, equipment room fittings, racks, frames and enclosures, data communications switches, hubs, and routers, common use systems, and paging systems.
   7) Vertical Transportation systems including.
   8) Architectural building systems including interior and exterior walls, windows, curtain walls, ceilings, and roof.

b. Collision Detection Reports: Based on information developed and included in the Contractor’s three-dimensional BIM, perform collision/interference checking and develop reports for review and resolution by the integrated Contractor team, including subcontractors, manufacturers and suppliers, working with the Design team where needed prior to release of fabrication drawings.

3. Schedule Visualization: Develop and maintain a three-dimension building information model for the expressed purpose of visually demonstrating and communicating proposed project construction schedule and phasing to University, subcontractors and suppliers as applicable. Include all major building systems and construct in such a fashion as to permit animation showing sequential construction of the project based on and driven by the approved Primavera construction schedule.

4. Prepare coordination digital data files according to the following requirements:
   a. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
   b. File Submittal Format: Submit or post coordination drawing files using format same as file preparation format and Portable Data File (PDF) format.
   c. BIM File Incorporation: Develop and incorporate coordination drawing files into Building Information Model established for Project.
      1) Perform three-dimensional component conflict analysis as part of preparation of coordination drawings. Resolve component conflicts
prior to submittal. Indicate where conflict resolution requires
modification of design requirements by Architect/Engineer.
d. Architect/Engineer will furnish Contractor one set of digital data files of
Drawings for use in preparing coordination digital data files.
   1) Architect/Engineer makes no representations as to the accuracy or
      completeness of digital data files as they relate to Drawings.
   2) Digital Data Software Program: Drawings are available in <Insert
      name and version of digital data software program and operating
      system>.
   3) Contractor shall execute a data licensing agreement in the form of
      Agreement form acceptable to University and Architect/Engineer.
5. Review: At request of Contractor and at Architect/Engineer’s discretion,
Architect/Engineer will participate in BIM coordination and review meetings and
will review coordination model and drawings to confirm that the Work is being
coordinated, but not for the details of the coordination, which are the Contractor’s
responsibility. If the Architect/Engineer determines that the coordination model
and drawings are not being prepared in sufficient scope or detail, or are
otherwise deficient, the Architect/Engineer will inform the Contractor, who shall
make changes as directed and resubmit.

D. Interference Resolution: Whenever job measurements and an analysis of the building
coordination model, Drawings and Specifications indicate that the various systems
cannot be installed without significant deviation from the intent of the Contract, prepare
interference drawings as required to indicate conflict between the various systems and
other components of the building such as beams, columns, and walls. Include plans,
elevations, sections, and other details drawn to large scale as required to clearly define
the interference and to indicate the Contractor’s proposed solution. Submit
interference drawings for review by the Architect prior to proceeding with work in the
general areas of the conflict.

1.7 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or
interpretation of the Contract Documents, Contractor shall prepare and submit an RFI
in the form specified.
   1. Architect/Engineer will return RFIs submitted to Architect/Engineer by other
      entities controlled by Contractor with no response.
   2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in
      Contractor’s work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information
or interpretation and the following:
   1. Project name.
   2. Project number.
   3. Date.
   4. Name of Contractor.
   5. Name of Architect/Engineer.
   6. RFI number, numbered sequentially.
   7. RFI subject.
   8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
   a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Hard copy form or software-generated form with substantially the same content as indicated above, acceptable to Architect/Engineer.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Architect/Engineer's Action: Architect/Engineer will review each RFI, determine action required, and respond. Allow seven calendar days for Architect/Engineer's response for each RFI. RFIs received by Architect/Engineer after 1:00 p.m. will be considered as received the following working day.
   1. The following Contractor-generated RFIs will be returned without action:
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for approval of Contractor's means and methods.
      d. Requests for coordination information already indicated in the Contract Documents.
      e. Requests for adjustments in the Contract Time or the Contract Sum.
      f. Requests for interpretation of Architect/Engineer's actions on submittals.
      g. Incomplete RFIs or inaccurately prepared RFIs.
   2. Architect/Engineer's action may include a request for additional information, in which case Architect/Engineer's time for response will date from time of receipt of additional information.
   3. Architect/Engineer's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Contractor-Initiated Change Order Bulletin and Proposal according to Section 01 26 00 "Contract Modification Procedures."
      a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect/Engineer in writing within seven calendar days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by RFI number. Submit log weekly. [Use CSI Log Form 13.2B or Contractor-generated form of substantially same content.] [Use softsware log that is part of Project Web site.] Include the following:
   1. Project name.
   2. Name and address of Contractor.
   3. Name and address of Architect/Engineer.
   4. RFI number including RFIs that were returned without action or withdrawn.
   5. RFI description.
   6. Date the RFI was submitted.
   7. Date Architect/Engineer's response was received.
F. On receipt of Architect/Engineer’s action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect/Engineer within seven calendar days if Contractor disagrees with response.

1.8 PROJECT WEB SITE

A. Provide, administer, and use Project Web site for purposes of hosting and managing project communication and documentation until Final Completion. Project Web site shall include the following functions:
   1. Project directory.
   2. Project correspondence.
   3. Meeting minutes.
   5. RFI forms and logs.
   7. Electronic submittal document hosting, viewing and transmitting.
   8. Drawing and specification document hosting, viewing, and updating.
   10. Change orders.
   11. Daily reports.
   12. Punchlists.

B. Provide up to twenty-five (25) Project Web site user licenses for use of the University, Architect/Engineer, and Architect/Engineer’s consultants. Provide eight hours of software training at Project Site office for Project Web site users.

C. On completion of Project, provide one each complete archive copy of Project Web site files to University and to Architect/Engineer in a digital storage format acceptable to Architect/Engineer.

D. Software:
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Meridian Systems; Prolog or ProjectTalk under their current published licensing agreements. Comparable software by other software suppliers may be provided if approved in writing at the sole discretion of the Architect/Engineer in consultation with the University Project Manager.

E. Contractor, subcontractors, and other parties granted access by Contractor to Project Web site shall execute a data licensing agreement in the form of Agreement acceptable to University and Architect/Engineer.

1.9 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify University and
Architect/Engineer of scheduled meeting dates and times a minimum of 4 business days prior to meeting.

a. Participants, including representatives of subcontractors and suppliers, shall be qualified, familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including University and Architect/Engineer, within three business days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time and site convenient to all parties, but not later than 14 calendar days after Notice to Proceed.

1. Conduct the conference to review responsibilities and personnel assignments.

2. Attendees: Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work and include the following:
   a. Authorized representatives of University:
      1) University Project Manager.
      2) University Building Maintenance Operations (BMO) Representative.
   b. Architect/Engineer and their consultants.
   c. Contractor's project manager and superintendent.
   d. Major subcontractors and suppliers.
   e. Other concerned parties shall attend the conference.

3. Agenda: Discuss items of significance that could affect progress, including the following:
   a. Designation of key personnel and their duties.
   b. Lines of communications.
   c. List of major subcontractors and suppliers.
   d. Tentative construction schedule.
      1) Phasing.
      2) Critical work sequencing and long-lead items.
      3) Equipment deliveries and priorities.
   e. Procedures and processing of:
      2) RFI's
      3) Testing and inspecting.
      4) Applications for Payment.
      5) Submittals.
      6) Preparation of record documents.
   f. Use of the premises, existing building and adjacent buildings as applicable.
      1) Work restrictions.
      2) Working hours.
      3) University's occupancy requirements.
      4) Procedures for disruptions and shutdowns.
      5) Construction parking and staging.
      6) Construction route and site access.
      7) Office, work, and storage areas.
      8) Progress cleaning and housekeeping procedures.
   g. Project coordination.
h. Distribution of the Contract Documents.
i. Temporary facilities and controls.
j. Indoor Air Quality Plan and Monitoring including procedures for moisture and mold control.
k. Construction waste management and recycling.
l. Safety.
   1) Fire and Life Safety.
   2) Health and Safety.
m. First aid.
n. Security.
o. Building Department.
p. Telecommunications.
q. Building Services.
r. Building Operations.
s. University Work Related Policies.
t. Contractor Contacts.
u. University Contacts.
v. University Process Forms.
   1) Key Request Form.
   2) Access Control Badge Application Form.
   3) Utility Interruption Request Form.
   4) Utility Start-Up Form.
   5) Fire Alarm/ Sprinkler Disable Request Form.
   6) Hot Work Permit Form.
   7) Anschutz Medical Campus (AMC) Street and Parking Lot Closure Form.
   8) Indoor Air Quality (IAQ) Plan.
   9) IAQ Planning Checklist.
   10) IAQ Inspection Checklist.
   11) Request for Variance.

4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. LEED Coordination Conference: For projects pursuing LEED certification, schedule and conduct a LEED coordination conference before starting construction, at a time convenient to University Architect/Engineer, and Contractor.

1. Attendees: Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work and include the following:
   a. University Project Manager.
   b. Architect/Engineer and their consultants.
   c. Contractor’s project manager, superintendent and LEED coordinator.
   d. Major subcontractors and suppliers.
   e. Other concerned parties.

2. Agenda: Discuss items of significance that could affect meeting requirements for LEED certification, including the following:
   a. LEED Project Checklist.
   b. Procedures for selecting and monitoring status for achieving Project goals related to recycled content and regional materials.
   c. General requirements for LEED-related procurement and documentation.
   d. Project closeout requirements and LEED certification procedures.
   e. Role of LEED coordinator.
f. Construction waste management.
g. Construction operations and LEED requirements and restrictions.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

D. Preinstallation Conferences: Conduct a preinstallation conference at Project site for installations, systems or assemblies where required by individual Specification Sections, or where deemed necessary by Contractor.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect/Engineer of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following, as appropriate:
   b. Options.
   c. Related RFIs.
   d. Related Change Orders.
   e. Purchases.
   f. Deliveries.
   g. Submittals.
   h. LEED requirements, for projects pursuing LEED certification.
   i. Review of mockups.
   j. Possible conflicts.
   k. Compatibility requirements.
   l. Time schedules.
   m. Weather limitations.
   n. Manufacturer’s written instructions.
   o. Warranty requirements.
   q. Acceptability of substrates.
   r. Temporary facilities and controls.
   s. Space and access limitations.
   t. Regulations of authorities having jurisdiction.
   u. Testing and inspecting requirements.
   v. Installation procedures.
   w. Coordination with other work.
   x. Required performance results.
   y. Protection of adjacent work.
   z. Protection of construction and personnel.

3. Record significant conference discussions, approved schedules, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information, including University Project Manager and Architect/Engineer.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
E. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to University and Architect/Engineer, but no later than [90][30] calendar days prior to the scheduled date of Substantial Completion or Partial Substantial Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.

2. Attendees: Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work and include the following:
   a. University Project Manager.
   c. Architect/Engineer and their consultants.
   d. Contractor’s project manager and superintendent.
   e. Major subcontractors and suppliers.
   f. Other concerned parties.

3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
   a. Procedures related to:
      1) Notice of Completion, including preparation of Contractor’s punch list.
      2) Final Inspection.
      3) Notice of Substantial Completion.
      4) Notice of Approval of Occupancy/Use.
      5) Supplemental Occupancy/Use Checklist.
      6) Supplemental Acceptance Checklist.
      7) Pre-acceptance Checklists.
      8) Notice of Acceptance.
      9) Settlement and Final Payment.
   b. Preparation of record documents.
   c. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
   d. Submittal of written warranties.
   e. Requirements for completing LEED documentation, for projects pursuing LEED certification.
   f. Requirements for preparing operations and maintenance data.
   g. Requirements for delivery of material samples, attic stock, and spare parts.
   h. Requirements for demonstration and training.
   i. University's partial occupancy requirements.
   j. Installation of University's furniture, fixtures, and equipment.
   k. Responsibility for removing temporary facilities and controls.

4. Minutes: Entity conducting meeting will record and distribute meeting minutes.

F. Progress Meetings: Conduct progress meetings at weekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.

2. Attendees: Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work and include the following:
   a. University Project Manager.
   b. University Health Safety Department Representative.
   d. University Campus Building Official.
   e. Architect/Engineer and their consultants.
   f. Contractor’s project manager and superintendent.
   g. Major subcontractors and suppliers.
h. Other entities concerned with current progress or involved in planning, coordination, or performance of future activities.

i. As needed, University Building Maintenance Operations (BMO), Subject Matter Experts (SME), and University Facility Support Services (FSS) Representatives.

3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
   a. Contractor's Construction Schedule:
      1) Review progress since the last meeting.
      2) Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule.
      3) Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
      4) Review schedule for next two week period.
      5) Review schedule of deliveries.
      6) Review off-site fabrication.

b. Site Safety.

c. Indoor Air Quality Management monitoring.

d. Quality:
   1) Quality and work standards.
   2) Status of correction of deficient items.
   3) Progress cleaning.
   4) Field observations.

e. Status of submittals.

f. Status of RFIs.

g. Status of Changes including:
   1) Change Order Bulletins.
   2) Change Order Proposals.
   3) Change Orders.
   4) Pending claims and disputes.

h. Status of LEED documentation, for projects pursuing LEED certification.

i. Review present and future needs of each entity present including:
   1) Access.
   2) Site utilization.
   3) Temporary facilities and controls.
   4) Coordination.

4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

G. Pay Application and Schedule Review Meeting: Conduct review meeting monthly on or about the 25th of each month.

1. Attendees:
   a. University Project Manager.
   b. Architect/Engineer.
   c. Contractor's Project Manager, Superintendent and Scheduler.

2. Agenda: Review draft pay application and progress schedule update in accordance with the requirements of Section 01 29 00 “Payment Procedures” and Section 01 32 00 “Construction Progress Documentation.”
PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00
SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
   1. Startup construction schedule.
   2. Contractor's construction schedule.
   3. Construction schedule updating reports.
   4. Daily construction reports.
   5. Monthly project status reports.
   6. Material location reports.
   7. Site condition reports.
   8. Special reports.

B. Related Requirements:
   1. Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.
   2. Section 01 40 00 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum [exclusive of profit, overhead, and general conditions costs].

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
D. Critical Path: The longest connected chain of interdependent activities through the
network schedule that establishes the minimum overall Project duration and contains
no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.
1. Float time is not for the exclusive use or benefit of either University or Contractor,
   but is a jointly owned, expiring Project resource available to both parties as
   needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely
   affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without
   adversely affecting the planned Project completion date.

G. Resource Loading: The allocation of manpower necessary for the completion of an
activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:
   1. Working electronic copy of schedule file, where indicated.
   2. PDF electronic file and four paper copies.

B. Startup construction schedule (bar chart).
   1. Approval of cost-loaded, startup construction schedule will not constitute
      approval of schedule of values for cost-loaded activities.

C. Contractor’s Preliminary Schedule and Startup Network Diagram: Of size required to
display entire network for entire construction period. Show logic ties for activities.

D. Contractor’s Detailed Construction Schedule: Initial schedule, of size required to
display entire schedule for entire construction period.
   1. Submit a working electronic copy of schedule, using software indicated, and
      labeled to comply with requirements for submittals. Include type of schedule
      (initial or updated) and date on label.

E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports.
   Format for each activity in reports shall contain activity number, activity description,
cost and resource loading, original duration, remaining duration, early start date, early
finish date, late start date, late finish date, and total float in calendar days.
   1. Activity Report: List of all activities sorted by activity number and then early start
      date, or actual start date if known.
   2. Logic Report: List of preceding and succeeding activities for all activities, sorted
      in ascending order by activity number and then early start date, or actual start
      date if known.
   3. Total Float Report: List of all activities sorted in ascending order of total float.
   4. Earnings Report: Compilation of Contractor's total earnings from
      commencement of the Work until most recent Application for Payment.
F. Construction Schedule Updating Reports: Submit draft for discussion at monthly project schedule and pay application review meeting. Submit final report with monthly Application for Payment.

G. Daily Construction Reports: Submit at weekly intervals.

H. Material Location Reports: Submit at monthly intervals.

I. Site Condition Reports: Submit at time of discovery of differing conditions.

J. Special Reports: Submit at time of unusual event.

K. Qualification Data: For scheduling consultant or in-house scheduling expert.

1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with a minimum of 5 years experience and capability of producing CPM reports and diagrams within 24 hours of Architect/Engineer's request.

B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:
   1. Review software limitations and content and format for reports.
   2. Verify availability of qualified personnel needed to develop and update schedule.
   3. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial University occupancy, as may be applicable.
   4. Review delivery dates for University-furnished products.
   5. Review schedule for work of University's separate contracts.
   6. Review submittal requirements and procedures.
   7. Review time required for review of submittals and resubmittals.
   8. Review requirements for tests and inspections by independent testing and inspecting agencies.
   9. Review time required for Project closeout and University startup procedures, including commissioning activities.
  10. Review and finalize list of construction activities to be included in schedule.
  11. Review procedures for updating schedule.

1.6 COORDINATION

A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
   1. Secure time commitments for performing critical elements of the Work from entities involved.
   2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.
PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for commencement of the Work to date of Substantial Completion.
   1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date is not permitted. Contract completion date may only be modified by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
   1. Activity Duration: Define activities so no activity is longer than 21 calendar days, unless specifically allowed by Architect/Engineer.
   2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 calendar days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
   3. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
   4. Startup and Testing Time: Include adequate time for startup, testing and commissioning.
   5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect/Engineer's administrative procedures necessary for issuing Notice of Substantial Completion.

C. Constraints: Include the following constraints and work restrictions as indicated in the Contract Documents and as applicable in schedule; show how the sequence of the Work is affected.
   1. Phasing: Arrange list of activities on schedule by phase.
   2. Work by University: Include a separate activity for each portion of the Work performed by University.
   3. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
   4. University-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
   5. Work Restrictions: Show the effect of the following items, as applicable, on the schedule:
      a. Coordination with existing construction.
      b. Limitations of continued occupancies.
      c. Uninterruptible services.
      d. Partial occupancy before Substantial Completion.
      e. Use of premises restrictions.
      f. Environmental control.
   6. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
      a. Submittals.
b. Mockups.
c. Fabrication.
d. Sample testing.
e. Deliveries.
f. Installation.
g. Tests and inspections.
h. Building flush-out.
i. Startup and placement into final use and operation.

7. Construction Areas: As applicable, identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
   a. Structural completion.
   b. Temporary enclosure and space conditioning.
   c. Permanent space enclosure.
   d. Completion of mechanical installation.
   e. Completion of electrical installation.
   f. Substantial Completion.

D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Commencement of Work, Substantial Completion, Notice of Occupancy and Use, and Final Acceptance. As applicable, also include milestones for Partial Substantial Completion and Partial Notice of Occupancy and Use.

E. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

F. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules and as approved by University and Architect/Engineer.

2.2 STARTUP CONSTRUCTION SCHEDULE (BAR CHART)

A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within seven calendar days of date established for commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 calendar days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (BAR CHART OR GANTT CHART)

A. Bar-Chart or Gantt-Chart Schedule: Submit startup, horizontal, bar-chart-type or a comprehensive, fully developed, horizontal, Gantt-chart-type construction schedule
within 30 calendar days of date established for commencement of the Work. Base schedule on the startup construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Use the same breakdown of construction activities as indicated in the Schedule of Values.
   1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar. With each required construction schedule update, place a contrasting mark in each bar to indicate actual completion.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. General: Prepare network diagrams using AON (activity-on-node) format.

B. Contractor's Preliminary Schedule and Startup Network Diagram: Submit diagram within 14 calendar days of date established for commencement of the Work. Outline significant construction activities for the first 90 calendar days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. CPM Schedule: Prepare Contractor's detailed construction schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
   1. Develop network diagram and submit CPM schedule within 45 calendar days after date established for commencement of the Work.
      a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect/Engineer's approval of the schedule.
   2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
   3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
   4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.

D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using contractor's preliminary schedule and startup network diagram, prepare a skeleton network to identify probable critical paths.
   1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
      a. Preparation and processing of submittals.
      b. Mobilization and demobilization.
      c. Purchase of materials.
      d. Delivery.
e. Fabrication.
f. Utility interruptions.
g. Installation.
h. Work by University that may affect or be affected by Contractor’s activities.
i. Testing and commissioning.
j. Punch list and final completion.
k. Activities occurring following final completion.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.

3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
   a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

5. Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Assign activities and costs for mobilization, bonds, permits and insurance. Obtain Architect/Engineer’s approval prior to assigning costs to material procurement activities if intending to bill for materials stored on site. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents, LEED documentation, and demonstration and training (if applicable), in the amount of not more than 5 percent of the Contract Sum.
   a. Each activity cost shall reflect an appropriate value subject to approval by Architect/Engineer.
   b. Total cost assigned to activities shall equal the total Contract Sum [exclusive of general conditions, overhead and profit costs].
   c. As requested by University, code activities to permit sorting of Schedule of Values by CSI Division, funding sources, sub-trades, building systems, Bid Packages as applicable, or combinations thereof.
   d. Resource load activities with forecasted manpower and code to permit production of graphically depicted manpower report. Show manpower effort for each subcontractor and as an aggregate for each month.

E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.

F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Main events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
10. Dollar value of activity (coordinated with the schedule of values).

G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
5. Changes in the critical path.
6. Changes in total float or slack time.

H. Summary Reports: With each schedule update, at a minimum provide the following hard copy cost and resource reports:
1. Cost report showing activity dollar value, dollar value of work in place to-date and dollar value for current period.
2. Cost report showing activity dollar value, dollar value of work in place to-date, and dollar value for current period summarizing to schedule of values.
3. Resource report showing man-day allocations by specific trade on each activity.
5. Cash flow report showing monthly projections of expenditures.
6. Narrative schedule report documenting:
   a. Description of the actual work accomplished during the reporting period.
   b. Description of any problem areas.
   c. Description of current and anticipated delays with recommended corrective actions to mitigate such delays.
   d. A list of proposed modifications, additions, deletions, and changes in logic to the approved construction schedule.

2.5 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (see special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Services connected and disconnected.
16. Equipment or system tests and startups.
17. Partial completions and occupancies.
18. Substantial Completions authorized.

B. Monthly Project Status Report: Prepare a monthly project status report including the following:
   1. Current status of Project:
      a. Schedule.
      b. Cost.
      c. MBE and WBE participation, as applicable.
      d. RFI’s.
      e. Submittals.
      f. Manpower.
      g. Safety.
   2. Narrative of progress achieved in previous month, activities anticipated for the next month, and issues affecting the rate of progress.
   3. Progress photographs in accordance with Section 01 32 33 “Photographic Documentation.”

C. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
   1. Material stored prior to previous report and remaining in storage.
   2. Material stored prior to previous report and since removed from storage and installed.
   3. Material stored following previous report and remaining in storage.

D. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.6 SPECIAL REPORTS

A. General: Submit special reports directly to University within one calendar day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor’s personnel, evaluation of results or effects, and similar pertinent information. Advise University in advance when these events are known or predictable.
PART 3 - EXECUTION

3.1 CONTRACTOR’S CONSTRUCTION SCHEDULE

A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
   1. In-House Option: University may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
   2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.

B. Contractor’s Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule draft update schedule for discussion and review at monthly project progress schedule and pay application review meeting.
   1. Revise schedule immediately after each meeting and issue updated schedule concurrently with submittal of monthly Application for Payment.
   2. Include summary reports with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
   3. As the Work progresses, indicate final completion percentage for each activity.
   4. Schedule updates may change logic but may not change milestone or critical path without prior approval of University and Architect/Engineer.

C. Distribution: Distribute copies of approved schedule to Architect/Engineer University, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
   1. Post copies in Project meeting rooms and temporary field offices.
   2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00
SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:
   1. Preconstruction photographs.
   2. Periodic construction photographs.
   3. Final completion construction photographs.

B. Related Requirements:
   1. Section 01 33 00 "Submittal Procedures" for submitting photographic documentation.
   2. Section 01 77 00 "Closeout Procedures" for submitting photographic documentation as project record documents at Project closeout.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For photographer.

B. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

C. Digital Photographs: Submit image files within three business days of taking photographs.
   1. Digital Camera: Minimum sensor resolution of 12 megapixels.
   2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
   3. Identification: Provide the following information with each image description in file metadata tag:
      a. Name of Project.
      b. Name and contact information for photographer.
      c. Name of Architect/Engineer.
      d. Name of Contractor.
      e. Date photograph was taken.
      f. Description of vantage point, indicating location, direction (by compass point), and elevation or story of construction.
g. Unique sequential identifier keyed to accompanying key plan.

1.4 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three years.

1.5 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from photographer to University for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

A. Photographer: Engage a qualified photographer to take construction photographs.

B. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
   1. Maintain key plan with each set of construction photographs that identifies each photographic location.

C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
   1. Date and Time: Include date and time in file name for each image.
   2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Architect/Engineer.

D. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect/Engineer.
1. Flag construction limits before taking construction photographs.
2. Take [20] <Insert number> photographs to show existing conditions adjacent to property before starting the Work.
3. Take [20] <Insert number> photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

E. Periodic Construction Photographs: Take [20] <Insert number> photographs monthly, coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.

F. Architect/Engineer-Directed Construction Photographs: From time to time, Architect/Engineer will instruct photographer about number and frequency of photographs and general directions on vantage points. Select actual vantage points and take photographs to show the status of construction and progress since last photographs were taken.

G. Final Completion Construction Photographs: Take [20] <Insert number> color photographs after date of Substantial Completion for submission as project record documents. Architect/Engineer will inform photographer of desired vantage points.
1. Do not include date stamp.

H. Additional Photographs: University through Architect/Engineer may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum.
1. Three business days' notice will be given, where feasible.
2. In emergency situations, take additional photographs within 24 hours of request.
3. Circumstances that could require additional photographs include, but are not limited to, the following:
   a. Special events planned at Project site.
   b. Immediate follow-up when on-site events result in construction damage or losses.
   c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
   d. Substantial Completion of a major phase or component of the Work.
   e. Extra record photographs at time of final acceptance.
   f. University's request for special publicity photographs.

END OF SECTION 01 32 33
SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Requirements:
   1. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
   2. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
   3. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
   4. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
   5. Division 02 through 33 for additional submittal requirements specific to indicated Specification Sections.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect/Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals." Submittals not specifically indicated as informational submittals are considered to be action submittals.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect/Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals" and include, but are not limited to:
   1. Schedules.
   2. Permits.
   3. Applications for payment.
   4. Performance and payment bonds.
   5. Insurance certificates.
7. Schedule of Values.
8. Inspection and test results.
10. Coordination drawings.

C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.


1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect/Engineer and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.

2. Initial Submittal: Submit concurrently with startup construction schedule and within 30 calendar days of Notice to Proceed or Commencement of Work, but not later than submittal of first application for payment. Include submittals required during the first 90 calendar days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.
   a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:
   a. Scheduled date for first submittal.
   b. Specification Section number and title.
   c. Submittal category: Action; informational.
   d. Name of subcontractor.
   e. Description of the Work covered.
   f. Scheduled date for resubmittal.
   g. Scheduled date for Architect/Engineer's final release or approval.
   h. Scheduled date of fabrication.
   i. Scheduled dates for purchasing.
   j. Scheduled dates for installation.
   k. Activity or event numbers.
1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect/Engineer's Digital Data Files: Electronic digital data files of the Contract Drawings will be provided by Architect/Engineer for Contractor's use in preparing submittals.

1. Architect/Engineer will furnish Contractor one set of digital data drawing files of the Contract Drawings for use in preparing Shop Drawings [and Project record drawings].
   a. Architect/Engineer makes no representations as to the accuracy or completeness of digital data drawing files as they relate to the Contract Drawings.
   b. Digital Drawing Software Program: The Contract Drawings are available in <Insert name and version of digital drawing software program and operating system>.
   c. Contractor shall execute a data licensing agreement in the form of Agreement form acceptable to University and Architect/Engineer.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit for review with sufficient time to avoid construction delays.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
   a. Architect/Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect/Engineer’s receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 14 calendar days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect/Engineer will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.

3. Resubmittal Review: Allow 14 calendar days for review of each resubmittal.

4. Large and/or Complex Submittals: For large and/or complex submittals, as determined by the Architect/Engineer and for submittals that require sequential reviews by Architect/Engineer’s consultants, a review period greater than 14 calendar days may be required. Architect/Engineer and Contractor shall identify such submittals upon submission of the submittal schedule and determine a mutually agreed upon review period.
D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately [6 by 8 inches] <Insert dimensions> on label or beside title block to record Contractor's review and approval markings and action taken by Architect/Engineer.
3. Include the following information for processing and recording action taken:
   a. Project name.
   b. Date.
   c. Name of Architect/Engineer.
   d. Name and address of Contractor.
   e. Name and address of subcontractor.
   f. Name and address of supplier.
   g. Name of manufacturer.
   h. Submittal number or other unique identifier, including revision identifier.
   1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01).
      Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
   i. Number and title of appropriate Specification Section.
   j. Drawing number and detail references, as appropriate.
   k. Location(s) where product is to be installed, as appropriate.
   l. Other necessary identification.
4. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect/Engineer observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
   a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect/Engineer.
5. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect/Engineer will return without review submittals received from sources other than Contractor.
   a. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
      1) Project name.
      2) Date.
      3) Destination (To:).
      4) Source (From:).
      5) Name and address of Architect/Engineer.
      6) Name and address of Contractor.
      7) Name of firm or entity that prepared submittal.
      8) Names of subcontractor, manufacturer, and supplier.
      9) Category and type of submittal.
      10) Submittal purpose and description.
      11) Specification Section number and title.
      12) Specification paragraph number or drawing designation and generic name for each of multiple items.
      13) Drawing number and detail references, as appropriate.
      14) Indication of full or partial submittal.
      15) Transmittal number.
16) Submittal and transmittal distribution record.
17) Remarks.
18) Contractor's certification that information complies with Contract Document requirements.
19) Signature of transmitter.

E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
   a. File name shall use project identifier and Specification Section number followed by a dash and then a sequential number (e.g., LNHS-061000-01). Resubmittals shall include an alphabetic suffix after another dash (e.g., LNHS-061000-01-A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect/Engineer.
4. Transmittal Form for Electronic Submittals: Use [software-generated form from electronic project management software] [electronic form] acceptable to University, containing the following information:
   a. Project name.
   b. Date.
   c. Name and address of Architect/Engineer.
   d. Name and address of Contractor.
   e. Name of firm or entity that prepared submittal.
   f. Names of subcontractor, manufacturer, and supplier.
   g. Category and type of submittal.
   h. Submittal purpose and description.
   i. Specification Section number and title.
   j. Specification paragraph number or drawing designation and generic name for each of multiple items.
   k. Drawing number and detail references, as appropriate.
   l. Location(s) where product is to be installed, as appropriate.
   m. Related physical samples submitted directly.
   n. Indication of full or partial submittal.
   o. Transmittal number.
   p. Submittal and transmittal distribution record.
   q. Other necessary identification.
   r. Contractor's certification that information complies with Contract Document requirements.
   s. Remarks.

F. Options: Identify options requiring selection by Architect/Engineer.

G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect/Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
H. Contractor Certification: On transmittal include Contractor's certification that information complies with Contract Document requirements.

I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block and clearly indicate extent of revision.
   3. Resubmit submittals until they are marked with approval notation from Architect/Engineer's action stamp.

J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

K. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect/Engineer's action stamp.

L. Record Documents: Retain complete additional copies of submittals on Project site to be submitted as record documents in accordance with requirements of Section 01 78 39 “Project Record Documents.”

M. Legibility: Provide clear and legible submittals. Submittals that are blurry or are for any reason unreadable will be returned without action.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
   1. Post electronic submittals as PDF electronic files directly to [Project Management Software Web site] specifically established for Project.
   2. Action Submittals: Submit three paper copies of each submittal to Architect/Engineer and one to University unless otherwise indicated. Architect/Engineer will return one copy.
   3. Informational Submittals: Submit two paper copies of each submittal to Architect/Engineer and one to University unless otherwise indicated. Architect/Engineer will not return copies.
   4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
   1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
   2. Mark each copy of each submittal to show which products and options are applicable.
   3. Include the following information, as applicable:
      a. Manufacturer's catalog cuts.
      b. Manufacturer's product specifications.
      c. Manufacturer's installation instructions.
      d. Manufacturer's printed recommendations.
      e. Standard color charts.
      f. Statement of compliance with specified referenced standards.
      g. Statement of compliance with specified trade association standards.
      h. Testing by recognized testing agency.
      i. Application of testing agency labels and seals.
      j. Notation of coordination requirements.
      k. Notation of dimensions verified by field measurement.
   4. For equipment, include the following in addition to the above, as applicable:
      a. Wiring diagrams showing factory-installed wiring.
      b. Printed performance curves.
      c. Operational range diagrams.
      d. Rough-in diagrams and templates indicating clearances required to other construction, if not indicated on accompanying Shop Drawings.
   5. Submit Product Data before or concurrent with Samples.
   7. Submit additional copies of Product Data as required complying with requirements of Section 01 78 39 “Project Record Documents.”

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Highlight, encircle or otherwise indicate deviations from Contract Documents. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data, unless submittal based on Architect/Engineer's digital data drawing files is otherwise permitted. Standard information prepared without specific reference to the Project is not considered a shop drawing.
   1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
      a. Identification of products.
      b. Schedules.
      c. Compliance with specified standards.
      d. Notation of coordination requirements.
      e. Notation of dimensions established by field measurement.
      f. Relationship and attachment to adjoining construction clearly indicated.
      g. Seal and signature of professional engineer if specified.
   2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than size of Construction Drawings.
   3. BIM File Incorporation: Develop and incorporate Shop Drawing files into Building Information Model established for Project.
a. Prepare Shop Drawings in the following format: Same digital data software program, version, and operating system as the original Drawings.

b. Refer to Section 01 31 00 "Project Management and Coordination" for requirements for coordination drawings.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

2. Mount, display or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to match the Architect/Engineer's Sample.

3. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.
   e. Specification paragraph number and generic name of each item.
   f. Compliance with recognized standards.
   g. Availability and delivery time.

4. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect/Engineer will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
   a. Number of Samples: Submit three sets of Samples. Architect/Engineer will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
      2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.

7. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity.
Sample sets may be used to determine final acceptance of construction associated with each set.

a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.

b. Samples not incorporated into the Work, or otherwise designated as University's property, are the property of Contractor.

8. Distribution of Samples: Prepare and distribute additional sets to Subcontractors, manufacturers, fabricators, suppliers, Installers, and others as required for performance of the Work. Show distribution on transmittal forms.

9. Field Samples and Mock-Ups: Field Samples and mock-ups specified in individual Sections are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

E. Selection of Related Materials: Where selections of colors, patterns, textures are specified to be made by Architect/Engineer, assemble complete samples of all specified or approved products for all Specification Sections and submit to Architect/Engineer. Review specifications and assemble all such samples for a combined single submittal. Indicate on the transmittal the latest date for selections to be made for each item to permit delivery of material in accordance with Progress Schedule. Architect/Engineer's action is limited solely to the specified selections or rejection of submittal items not in accordance with Specifications.

F. Coordination Drawing Submittals: Comply with requirements specified in Section 01 31 00 "Project Management and Coordination."

G. Contractor's Construction Schedule: Comply with requirements specified in Section 01 32 00 "Construction Progress Documentation."

H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 29 00 "Payment Procedures."

I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 40 00 "Quality Requirements."

J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 77 00 "Closeout Procedures."

K. Maintenance Data: Comply with requirements specified in Section 01 78 23 "Operation and Maintenance Data."

L. LEED Submittals: For project required to obtain LEED certification, comply with requirements specified in Division 01 Section "Sustainable Design Requirements".

M. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
N. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.

O. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

P. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

Q. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

R. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

S. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

T. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

U. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
   1. Name of evaluation organization.
   2. Date of evaluation.
   3. Time period when report is in effect.
   4. Product and manufacturers' names.
   5. Description of product.
   6. Test procedures and results.
   7. Limitations of use.

V. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

W. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
X. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

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

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
   1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

C. BIM File Incorporation: Incorporate delegated-design drawing and data files into Building Information Model established for Project.
   1. Prepare delegated-design drawings in the following format: Same digital data software program, version, and operating system as the original Drawings.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Engineer. Submittals received without Contractor’s substantive review and approval stamp will be rejected and returned to the Contractor.

B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 77 00 “Closeout Procedures.”

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

3.2 ARCHITECT/ENGINEER’S ACTION

A. Action Submittals: Architect/Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect/Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.

B. Informational Submittals: Architect/Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect/Engineer will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect/Engineer.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Submittals not required by the Contract Documents may be returned by the Architect/Engineer without action.

END OF SECTION 01 33 00
SECTION 01 35 44
SPECIAL PROCEDURES FOR ENVIRONMENTAL HEALTH AND SAFETY AND FIRE AND LIFE SAFETY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes special administrative and procedural requirements related to environmental health and safety.

B. University is Authority Having Jurisdiction (AHJ) for Fire and Life Safety. This responsibility is administered by the University’s Fire and Life Safety Officer.

C. Related Requirements:

1. Section 01 35 46 “Indoor Air Quality Procedures” for procedure related to maintaining indoor air quality during construction.
2. Section 02 81 00 “Transportation/Disposal of Hazardous Materials.”

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 ENVIRONMENTAL HEALTH AND SAFETY AND FIRE AND LIFE SAFETY PROCEDURES

A. Physical, Life, and Fire Safety:

1. All contractors are required to conform to the Federal Occupational Safety and Health Administration (OSHA) regulations for construction (29 CFR 1926). Certain General Industry Standards (29 CFR 1910) may also apply, depending on location of work.
2. Provide an effective health and safety program to control hazards, including but not limited to compressed gases, welding, electrical, safety netting, cranes, scaffolding and supplies on the roof.
3. Provide fire protection in all construction areas to the satisfaction of the Authority Having Jurisdiction.
4. During the construction phase, the Authority Having Jurisdiction may conduct oversight inspections to observe and provide recommendations regarding applicable safety standards. The following minimum items are included:
   
a. Do not block exit corridors. Install signage clearly identifying exit routes.
b. Provide physical barriers with appropriate warning signage to protect public areas from construction work.
c. Conduct daily inspections to eliminate fire hazards and any other safety hazards.
d. Periodic safety inspections will be performed on job sites by the Authority Having Jurisdiction. The Authority Having Jurisdiction for fire safety will present University’s Project Manager with a written summary of the findings who will then take these issues to the Contractor’s superintendent, foreman or other designated representative and return the summary form with documentation of the resolution of safety items to AHJ. Abate deficient items in a timely manner. Include documentation and resolution of safety items presented in weekly Progress Meeting minutes. Inspections by University AHJ are spot-checks only. They are not all encompassing. These inspections and recommendations do not relieve the Contractor from obligations related to safe work practices, as required under federal law.
e. AHJ has the right to access the site at all times. Should a potential threat to personnel or property be observed, AHJ may require the hazard related operation immediately altered until adequate safeguards are addressed.
f. Supply AHJ, through the University Project Manager, with a copy of Contractor’s weekly safety meeting minutes and safety inspection reports.
g. Provide signs used for proper identification of construction areas.
h. Provide adequate number of appropriately rated fire extinguishers to be available on-site for emergency use in the construction area.
i. Insure standpipes, pull stations, electrical panels, water control valves and fire hydrants are accessible at all times.
j. Post emergency notification phone numbers provided by Contractor and University in all construction areas.
k. Notify University Project Manager of any lost time injuries occurring on University’s property within one (1) calendar day and of any fatalities immediately.
l. Submit copies of all injury reports to AHJ, through University’s Project Manager.
m. Equip construction personnel with personal protective equipment (PPE) where required. Coordinate with University Project Manager to identify where use of PPE will be required.

B. OSHA Hazard Communication Standard:

1. Every Contractor and Subcontractor performing work shall to comply with the OSHA Hazard Communication Standard. Compliance includes joint University and Contractor responsibilities for the purpose of providing timely communications and information sharing with regard to hazardous materials, chemicals and chemical sources which may be present on-site or brought in by Contractor.
2. University Project Manager will provide Contractor with the following:
   a. Information regarding known hazardous chemicals and agents or other hazards present at the job site.
   b. University emergency procedures and contact numbers.

3. Provide safety training and environmental surveillance of all workers.

4. Inform and provide University's Project Manager the following:
   a. Material safety data sheets (MSDS) for all chemicals introduced into the workplace.
   b. Information regarding potential sources of pollutants which may be entrained in University's air intakes, e.g., roofing tar fumes, nuisance dusts, exhaust from internal combustion engines, welding or cutting fumes, and asbestos - if damaged or encountered during the course of the work.

C. Asbestos and Lead Paint:

1. The presence of asbestos-containing materials and/or paint containing lead on the job site does not mean a problem exists. Areas where asbestos is friable and not contained or lead paint is present or will be caused to be present in airborne or settled dust are of concern.

2. Responsibilities of University and Contractor regarding asbestos and lead paint are as follows:
   a. University:
      1) Notify the Contractor of the condition and location(s) where asbestos is known to be present or may reasonably be encountered, e.g., asbestos insulation, ceiling tiles, floor tiles, fire doors, wall and ceiling plasters, concrete, grouting, etc., and lead paint on metal building materials, walls, windows, etc.
      2) Coordinate with Contractor when response action is required by a Subcontractor.
      3) Contract with third party contractor to monitor areas where friable asbestos and/or lead-containing particles are present during construction/renovation projects for its own records and purpose. Monitoring results can be shared with Contractors but are in no way to be used for Contractor employee monitoring.
      4) Final authority on all asbestos-related concerns and contractual arrangements.

   b. Contractor:
      1) Notify University's Project Manager of any suspected or existing problem involving asbestos or lead and cease work in that area until University has assessed the situation.
      2) Ensure that undamaged asbestos-containing material and/or material containing lead, not included in the scope of the project, are not damaged.
3) Train and monitor their own employees, including Asbestos Awareness training and Lead Paint Awareness training, where applicable.

4) Be responsible for all environmental/industrial hygiene surveillance of its work staff and subcontractors and for required area monitoring where potential contamination of adjacent areas exists.

5) Prevent problems which can result in asbestos or lead exposure to building occupants.

6) Coordinate with the University’s EHS Department and Building Maintenance and Operations through University’s Project Manager and perform all activities that may potentially disturb asbestos containing materials in a manner acceptable to the EHS.

7) Follow State of Colorado regulation, Emission Standards for Asbestos, Part B, Control of Asbestos, “Regulation 8” and OSHA standards regulating exposure to asbestos and lead.

8) Where applicable, comply with Section 02 81 00 “Transportation/Disposal of Hazardous Materials.”

D. Carcinogens:

1. Contractor or any Subcontractor shall not knowingly install or cause to be installed any material or product containing carcinogens. Refer to Annual Report on Carcinogens, U.S. Department of Health and Human Services, National toxicology Program.

E. Hazardous Waste:

1. All hazardous wastes are to be handled and disposed of according to current University EHS guidelines which can be obtained through University Project Manager. Only individuals specifically authorized by University may sign hazardous waste manifests for wastes generated on University’s property. Only University approved transporters and disposal facilities are to be used for transportation and disposal of hazardous wastes.

F. The Control of Hazardous Energy (Lockout/Tagout):

1. Provide and enforce a program and procedures for the control of hazardous energy (lockout/tagout) including, but not limited to, locks, tags and lockout devices. Provide proof that workers have received safety training in the control of hazardous energy through lockout/tagout.

G. Hot Work Operations:

1. Comply with University hot work policy and obtain Hot Work Permit prior to executing any hot work in existing buildings.

2. Notify University Project Manager prior to any hot work on University property.

3. Provide and enforce a program to control fires during hot work operations. Provide appropriately rated fire extinguishers, fire retardant protective covers (when needed), and any other hot work related equipment.
H. Confined Space Entry:

1. Work in compliance with the “Confined Spaced Entry Procedure for Non-University Personnel” whenever any project requires entry into a confined space. A copy of this procedure can be obtained from University EHS through University's Project Manager.

I. Green Tagging of Work Area:

1. Obtain a Green Tag and Construction Permit from the University Project Manager prior to any work being conducted in a laboratory or on any exhaust ductwork system serving a laboratory. If a Green Tag has been issued, it will be displayed at the entry of the laboratory area. The Green Tag assures that any radioactive, chemical or biological materials have been removed from the laboratory verifying the area is free from hazards to workers. If a Green Tag is not displayed, coordinate tagging with EHS through University's Project Manager.

END OF SECTION 01 35 44
SECTION 01 35 46 - INDOOR AIR QUALITY PROCEDURES

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes administrative and procedural requirements for managing emissions and moisture control during construction.

1.3 DEFINITIONS
A. Sustainable Design Related Terminology: As defined is ASTM E 2114.
B. Adequate Ventilation: Ventilation, including air circulation and air changes, required to cure materials, dissipate humidity, and prevent accumulation of particulates, dust, fumes, vapors, or gases.
C. Hazardous Materials: Any material that is regulated as a hazardous material in accordance with 49 CFR 173, requires a Material Safety Data Sheet (MSDS) in accordance with 29 CFR 1910.1200, or which during end use, treatment, handling, storage, transportation or disposal meets or has components which meet or have the potential to meet the definition of a Hazardous Waste in accordance with 40 CFR 261. Throughout this specification, hazardous material includes hazardous chemicals.
   1. Hazardous materials include: pesticides, biocides, and carcinogens as listed by recognized authorities, such as the Environmental Protection Agency (EPA) and the International Agency for Research on Cancer (IARC).
D. Indoor Air Quality (IAQ): The composition and characteristics of the air in an enclosed space that affect the occupants of that space. The indoor air quality of a space refers to the relative quality of air in a building with respect to contaminants and hazards and is determined by the level of indoor air pollution and other characteristics of the air, including those that impact thermal comfort such as air temperature, relative humidity and air speed.
E. Interior Final Finishes: Materials and products that will be exposed at interior, occupied spaces including but not limited to flooring, wallcovering, finish carpentry, and ceilings.
F. Packaged Dry Products: Materials and products that are installed in dry form and are delivered to the site in manufacturer's packaging including but not limited to carpets, resilient flooring, ceiling tiles, and insulation.
G. Wet Products: Materials and products installed in wet form, including paints, sealants, adhesives, special coatings, and other materials which require curing.

1.4 QUALITY ASSURANCE

A. Inspection and Testing Lab Qualifications: Minimum of 5 years experience in performing the types of testing specified herein.

1.5 PRECONSTRUCTION MEETING

A. After award of Contract and prior to the commencement of the Work, schedule and conduct meeting with University and Architect/Engineer to review and discuss the proposed IAQ Management Plan and develop a mutual understanding of detailed requirements for maintaining indoor air quality and environmental protection.

1.6 SUBMITTALS

A. Indoor Air Quality (IAQ) Management Plan: Not less than 10 business days before the Pre-construction meeting, prepare and submit an IAQ Management Plan including, but not limited to, the following:
   1. Procedures for control of emissions during construction.
      a. Identify schedule for application of interior finishes.
   2. Procedures for moisture control during construction.
      a. Identify porous materials and absorptive materials.
      b. Identify schedule for inspection of stored and installed absorptive materials.
   3. Revise and resubmit Plan as required by University.
      a. Approval of Contractor’s Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations.

B. Product Data:
   1. Submit product data for filtration media used during construction and during operation. Include Minimum Efficiency Reporting Value (MERV).
   2. Submit air pressure difference maps for each mode of operation of HVAC.
   3. Material Safety Data Sheets: Submit MSDSs for inclusion in Operation and Maintenance Manual for the following products. Coordinate with Section 01 78 23 – Operation and Maintenance Data.
      a. Adhesives.
      b. Floor and wall patching/leveling materials.
      c. Caulking and sealants.
      d. Insulating materials.
      e. Fireproofing and firestopping.
      f. Carpet.
      g. Paint.
      h. Clear finish for wood surfaces.
      i. Lubricants.
      j. Cleaning products.

C. Inspection and Test Reports:
1. Moisture control inspections.
2. Moisture content testing.
3. Moisture penetration testing.
4. Microbial growth testing.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 IAQ MANAGEMENT - EMISSIONS CONTROL

A. Provide point person responsible for the implementation and assurance that the Indoor Air Quality Plan is being implemented.

B. University Indoor Air Quality Plan: Comply with the requirements of the University IAQ Plan, latest version, appended to this Specification Section.

C. Flush-Out: After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total air volume of 14,000 cu.ft. of outdoor air per sq.ft. of floor area while maintaining an internal temperature of at least 60 degrees F and relative humidity no higher than 60%.

3.2 IAQ MANAGEMENT - MOISTURE CONTROL

A. Housekeeping:
1. Keep materials dry. Protect stored on-site and installed absorptive materials from moisture damage.
2. Verify that installed materials and products are dry prior to sealing and weatherproofing the building envelope.
3. Install interior absorptive materials only after building envelope is sealed and weatherproofed.

B. Inspections: Document and report results of inspections; state whether or not inspections indicate satisfactory conditions.
1. Examine materials for dampness as they arrive. If acceptable to University, dry damp materials completely prior to installation; otherwise, reject materials that arrive damp.
2. Examine materials for mold as they arrive and reject materials that arrive contaminated with mold.
3. Inspect stored and installed absorptive materials regularly for dampness and mold growth. Inspect weekly.
   a. Where stored on-site or installed absorptive materials become wet, notify Architect/Engineer and University. Inspect for damage. If acceptable to University, dry completely prior to closing in assemblies; otherwise, remove and replace with new materials.
4. Basement: Monitor basement and crawlspace humidity, and dehumidify when relative humidity is greater than 85 percent for more than 2 weeks or at the first sign of mold growth.

5. Site drainage: Verify that final grades of site work and landscaping drain surface water and ground water away from the building.

6. Weather-proofing: Inspect moisture control materials as they are being installed. Include the following:
   a. Air and weather-resistive barrier: Verify air and weather-resistive barrier is installed without punctures and/or other damage. Verify air barrier and weather-resistive is sealed completely.
   b. Flashing: Verify correct shingling of the flashing for roof, walls, windows, doors, and other penetrations.
   c. Insulation layer: Verify insulation is installed without voids.
   d. Roofing: In accordance with ASTM D7186 Standard Practice for Quality Assurance Observation of Roof Construction and Repair

7. Plumbing: Verify satisfactory pressure test of pipes and drains is performed before closing in and insulating lines.

8. HVAC: Inspect HVAC system as specified in Section 23 08 00 – Commissioning.
   a. And, inspect HVAC to verify:
      1) Condensate pans are sloped and plumbed correctly.
      2) Access panels are installed to allow for inspection and cleaning of coils and ductwork downstream of coils.
      3) Ductwork and return plenums are air sealed.
      4) Duct insulation is installed and sealed.
      5) Chilled water line and refrigerant line insulation are installed and sealed.

C. Schedule:
   1. Schedule work such that absorptive materials, including but not limited to porous insulations, paper-faced gypsum board, ceiling tile, and finish flooring, are not installed until they can be protected from rain and construction-related water.
   2. Weather-proof as quickly as possible. Schedule installation of moisture-control materials, including but not limited to air and weather-resistive barriers, flashing, exterior sealants and roofing, at the earliest possible time.

D. Testing for Moisture Content: Test moisture content of porous materials and absorptive materials to ensure that they are dry before sealing them into an assembly. Document and report results of testing. Where tests are not satisfactory, dry materials and retest. If satisfactory results cannot be obtained with retest, remove and replace with new materials.
   1. Concrete: Moisture test prior to finishing floor application as specified in Division 09.
   2. Wood: Moisture test as per ASTM D4444 - Standard Test Methods for Use and Calibration of Hand-Held Moisture Meters; unless otherwise indicated acceptable upper limits for wood products are < 20% at center of piece; < 15% at surface.
   3. Gypsum Board, Gypsum Plaster, Insulation, and other absorptive materials: Moisture test with a Pinless Moisture Meter to assess patterns of moisture, if any.

E. Testing for Moisture Penetration:
   1. Windows: Test as per ASTM E1105 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 at 100 percent static-air-pressure difference specified in applicable Division 08 Sections; unless otherwise indicated, acceptable upper limits are no leakage for 15 minutes.

a. Number of Tests: 1 percent of openings but not less than two.

2. Horizontal Waterproofing (not roofing): Test as per ASTM D5957 Standard Guide for Flood Testing Horizontal Waterproofing Installations; acceptable upper limits are no leakage for 15 minutes.

a. Test frequency: 100 percent of horizontal waterproofed surfaces.

3. Masonry: Test as per ASTM C1601 Standard Test Method for Field Determination of Water Penetration of Masonry Wall Surfaces; acceptable upper limits are no leakage for 15 minutes.

4. Exterior Walls:

   a. Air tightness of the enclosure test: ASTM E779 Standard Test Method for Determining Air Leakage Rate by Fan Pressurization or ASTM E1827

      1) Air Leakage: The mean value of the air leakage flow rate calculated from measured data at 0.3 in wg (75 Pa) must not exceed 0.25 cu ft/minute per square foot of envelope area. Measurements must be referenced at standard conditions of 14.696 psi (101.325 KPa) and 68 deg F.

F. Testing for Support of Microbial Growth: Test and report in accordance with ASTM D6329 Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers. Indicate susceptibility of product or material to colonization and amplification of microorganisms. Identify microorganisms and conditions of testing.

1. Normal conditions: Perform testing at 35 degrees Centigrade and 50 percent relative humidity.

2. Extreme conditions: Perform worst case scenarios screening tests by providing an atmosphere where environmental conditions may be favorable for microbial growth.

3. Perform testing for the following:

   a. Fireproofing material on appropriate substrate.
   b. Ceiling tile.
   c. Wall covering.
   d. Other appropriate material.

END OF SECTION 01 35 46
Indoor Air Quality Plan
February 14, 2009

This plan describes the measures to be taken to provide good indoor air quality (IAQ) during construction and after construction is complete and the occupants have moved into the building. This plan is based on the SMACNA standard “IAQ Guidelines for Occupied Buildings under Construction” and the requirements of the LEED.

It is not the intent of this document to replace or supersede OSHA regulations as to safe construction workplace practices. It remains the responsibility of the Construction Manager and the individual sub-contractors to maintain safe building and site operations. Addition precautions may be necessary when hazardous materials are present.

The plan will address construction IAQ by recommending procedures in five areas of concern, which in turn will allow the building to achieve two LEED program points:

- HVAC system protection
- Containment source control
- Pathway interruption
- Housekeeping
- Scheduling

The following describes the specific measures to be performed in each area of concern:

1. HVAC Protection
   - During construction, provide MERV 13 filters for supply air intake when in use. Provide MERV 8 filters at the return air system openings when in use. Perform frequent maintenance when the HVAC system is being utilized and replace filters as they become loaded, prior to building flushout, and prior to occupancy.
   - When performing construction activities that produce dust, such as drywall sanding, concrete cutting, masonry work, wood sawing or adding insulation, seal off the supply diffusers and return air system openings completely for the duration of the task.
   - Shut down and seal off the supply diffusers and return air ducts during any demolition operations.
   - Whenever the HVAC system is not used during construction, seal off the supply diffusers and return air system openings to prevent the accumulation of dust and debris in the duct system.
   - Do not use the mechanical rooms to store construction or waste materials. Keep rooms clean and neat.
   - Provide periodic duct inspections during construction; if the ducts become contaminated due to inadequate protection, clean the ducts professionally in accordance with NADCA (National Air Duct Cleaning Association) standards.
   - The General Contractor shall take photographs showing measures in place.

2. Source Control
   - Use low VOC products as indicated by the specifications to reduce potential problems.
• Restrict traffic volume and prohibit idling of motor vehicles where emissions could be drawn into the building.
• Utilize electric or natural gas alternatives for gasoline and diesel equipment where possible and practical. Use low-sulfur diesel in lieu of regular diesel.
• Cycle equipment off when not being used or needed.
• Exhaust pollution sources to the outside with portable fan systems. Prevent exhaust from recirculating back into the building from construction equipment outside the building.
• Keep containers of wet products closed as much as possible. Cover or seal containers of waste materials that can release odor or dust.
• Protect stored on-site or installed absorptive building materials from weather and moisture; wrap with plastic and seal tight to prevent moisture absorption.
• The General Contractor shall take photographs showing measures in place.

3. Pathway Interruption

• Provide dust curtains or temporary enclosures to prevent dust from migrating to other areas when applicable.
• Locate pollutant sources as far away as possible from supply ducts and areas occupied by workers when feasible. Supply and exhaust systems may have to be shut down or isolated during such activity.
• During construction, isolate areas of work to prevent contamination of clean or occupied areas. Pressure differentials may be utilized to prevent contaminated air from entering clean areas.
• Depending on weather, ventilation using 100% outside air will be used to exhaust contaminated air directly to the outside during installation of VOC emitting materials.

4. Housekeeping

• Provide regular cleaning concentrating on HVAC equipment and building spaces to remove contaminants from the building prior to occupancy.
• All coils, air filters, fans and ductwork shall remain clean during installation and, if required, will be cleaned prior to performing the testing, adjusting and balancing of the systems.
• Suppress and minimize dust with wetting agents or sweeping compounds. Utilize efficient and effective dust collecting methods such as a damp cloth, wet mop, or vacuum with particulate filters, or wet scrubber.
• Remove accumulations of water inside the building. Protect porous materials such as insulation and ceiling tile from exposure to moisture.
• Thoroughly clean all interior surfaces prior to replacing filters and running HVAC system for system balancing, commissioning and building flushout.
• Provide photographs of the above activities during construction to document compliance.

5. Scheduling and Construction Activity Sequence

• Schedule high pollution activities that utilize high VOC level products (including paints, sealers, insulation, adhesives, caulking and cleaners) to take place prior to installing highly absorbent materials (such as ceiling tiles, gypsum wall board, fabric furnishing, carpet and insulation, for example). These materials will act as ‘sinks’ for VOCs, odors and other contaminants, and release them later after occupancy.

PLANNING AND INSPECTION CHECKLISTS

The planning and inspection checklists included in this document are useful to ensure construction IAQ management is planned and implemented correctly. The planning checklist should be completed by the contractor prior to construction. The inspection checklists should be completed monthly to confirm the IAQ management plan is being followed. At the time of inspection, photographs should be taken to support the checklist and to provide audit documentation for the USGBC.
University of Colorado Denver IAQ
February 14, 2009

Planning Checklist
(Must be completed weekly)

Project: ____________________________________________
Completed by: _______________________________________
(Name & Company)
Date: ____________________________

1. HVAC Protection
   - MERV 13 filters at supply air intake
   - MERV 8 filters at return air openings
   - Seal supply diffusers and return air during demolition
   - Seal supply diffusers and return air openings during construction
   - Mechanical rooms clean and neat
   - Periodic duct inspections during construction
   - General Contractor to document with photographs

2. Source Control
   - Low/no VOC products as indicated by specifications
   - Restrict vehicle traffic volume and prohibit idling
   - Utilize electric or natural gas alternatives for gasoline and diesel
   - Cycle equipment off when not being used or needed
   - Exhaust pollution sources to the outside
   - Keep containers of wet products closed
   - Cover or seal containers of waste materials
   - Protect absorptive building materials from weather and moisture
   - Prevent fume migration from construction vehicles and equipment into adjacent buildings
   - General Contractor to document with photographs

3. Pathway Interruption
   - Provide dust curtains or temporary enclosures
   - Locate pollutant sources as far away as possible from supply dusts and areas occupied by workers
   - General Contractor to document with photographs
   - Isolate areas of work to prevent contamination of clean or occupied areas
   - When using VOC emitting materials ventilate using 100% outside air
4. **Housekeeping**

- Provide regular cleaning, including HVAC equipment
- If necessary clean HVAC equipment prior to testing, adjusting and balancing the systems
- Suppress and minimize dust with wetting agents or sweeping compounds
- Remove accumulations of water inside the building
- Protect porous materials
- General Contractor to document with photographs

5. **Scheduling and Construction Activity Sequence**

- Schedule high pollution activities prior to installing absorbent materials
- General Contractor to document with photographs

I confirm the checked activities to be proceeding according to the Construction Indoor Air Quality Plan. Items that are not checked will be addressed, initialed and dated once corrective actions have been taken. Items that are not applicable are labeled as such.

Signed: ____________________________________ Date: ________________

(Contractor)
University of Colorado Denver IAQ
February 14, 2009

**Inspection Checklist**
(Must be completed weekly)

**Project**
[ ]

**Completed by:**
[ ]

(Name & Company)

**Date:**
[ ]

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1. **HVAC Protection**
   - MERV 13 filters at supply air intake
   - MERV 8 filters at return air openings
   - Seal supply diffusers and return air during demolition
   - Seal supply diffusers and return air openings during construction
   - Mechanical rooms clean and neat
   - Periodic duct inspections during construction
   - General Contractor to document with photographs

2. **Source Control**
   - Low/no VOC products as indicated by specifications
   - Restrict vehicle traffic volume and prohibit idling
   - Utilize electric or natural gas alternatives for gasoline and diesel
   - Cycle equipment off when not being used or needed
   - Exhaust pollution sources to the outside
   - Keep containers of wet products closed
   - Cover or seal containers of waste materials
   - Protect absorptive building materials from weather and moisture
   - General Contractor to document with photographs

3. **Pathway Interruption**
   - Provide dust curtains or temporary enclosures
   - Locate pollutant sources as far away as possible from supply ducts and areas occupied by workers
   - General Contractor to document with photographs
   - Isolate areas of work to prevent contamination of clean or occupied areas
   - When using VOC emitting materials ventilate using 100% outside air
   - General Contractor to document with photographs

4. **Housekeeping**
Provide regular cleaning, including HVAC equipment
If necessary clean HVAC equipment prior to testing, adjusting and balancing the systems
Suppress and minimize dust with wetting agents or sweeping compounds
Remove accumulations of water inside the building
Protect porous materials
General Contractor to document with photographs

5. Scheduling and Construction Activity Sequence
Schedule high pollution activities prior to installing absorbent materials
General Contractor to document with photographs

I confirm the checked activities to be proceeding according to the Construction Indoor Air Quality Plan. Items that are not checked will be addressed, initialed and dated once corrective actions have been taken. Items that are not applicable are labeled as such.

Signed: _______________________________ Date: ______________

(Contractor)
SECTION 01 35 96 - SPECIAL PROCEDURES FOR PROPERTY PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Procedures for establishing existing conditions and monitoring procedures for protection of adjacent or nearby structures and improvements including, but not limited to, sidewalks, landscaping, parking facilities, roadways, or driveways, whether on or off the University's property arising from [drilled caissons] [underpinning existing foundations] [new foundations or excavations below adjacent or nearby buildings] [sheet piling] <insert other relevant construction operation>.

1.2 UNIVERSITY'S SURVEY

A. University has obtained visual inspections of adjacent and nearby buildings together with photographic records showing details and conditions. This survey was made on <insert date> and the photographs are dated and certified by the photographer as of that date. One set of these data is available for Contractor's use and records.

1.3 SUBMITTALS

A. Submit photographs and survey data from same points as original, certified and dated by photographer and taken upon completion of [pile driving] [caisson work] [underpinning existing foundations] [backfilling] <insert relevant construction operation>.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 MONITORING

A. Establish accurate levels and positions of all elements relative to other fixed points to permit accurate monitoring of potential changes.

B. At all times during construction activities which are likely to affect adjacent properties, improvements or building, monitor conditions carefully including horizontal or vertical movements, changes in existing cracks, joints or defects or development of new cracks and other evidence of changing conditions. Report immediately to University's Project Manager and Architect/Engineer any changes to existing conditions and stop work where such appear to be significant or potentially dangerous to persons or property.
3.2 REMEDIES

A. Conduct construction operations and specifically [excavation] [caisson drilling] [sheet piling] [underpinning] [shoring] <Insert other relevant construction operation> in a manner that will avoid damage to adjacent buildings, structures, properties or improvements. Promptly remedy any such damage whether to University's or other property and hold the University harmless from such damage.

3.3 POST-CONSTRUCTION SURVEY

A. Within 30 calendar days of completion of those construction activities that would potentially damage adjacent or nearby properties, re-survey all items of University's original survey and Contractor's supplemental information, including monitoring control points. Perform this work using a licensed surveyor and independent photographer. Identify specifically each changed condition, its magnitude and probable cause.

END OF SECTION 01 35 96
SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
   1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
   2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
   3. Requirements for Contractor to provide quality-assurance and -control services required by Architect/Engineer, University, or authorities having jurisdiction are not limited by provisions of this Section.
   4. Specific test and inspection requirements are not specified in this Section.

C. Related Requirements:
   1. Section 01 42 00 "Reference" for list of references, standards and definitions.
   2. Section 01 91 13 "General Commissioning" for coordination of testing with commissioning activities.
   3. Division 23 for testing, adjusting and balancing of mechanical systems.
   4. Division 26 for testing of electrical systems.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect/Engineer.
C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. As indicated in individual Specifications Sections or on the Drawings, the Work may include the following types of mockups:
   a. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
   b. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
   c. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.

D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect/Engineer for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect/Engineer for a decision before proceeding.

1.5 ACTION SUBMITTALS

A. Shop Drawings: Where integrated exterior mockups are required and indicated on the Drawings, provide plans, sections, and elevations, indicating materials and size of mockup construction.
   1. Indicate manufacturer and model number of individual components.
   2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
   1. Seismic-force-resisting system, designated seismic system, or component listed in the designated seismic system quality-assurance plan prepared by Architect/Engineer.

B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
   1. Specification Section number and title.
   2. Entity responsible for performing tests and inspections.
   3. Description of test and inspection.
   4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.7 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.
D. Permits, Licenses, and Certificates: For University’s records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.8 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
   1. Monitor quality control over products, services, site conditions, and workmanship to produce work of specified quality.
   2. Comply fully with manufacturers' instructions, including each step in sequence.
   3. If manufacturers’ instructions conflict with Contract Document requirements, request clarification from Architect/Engineer before proceeding.
   4. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
   5. Perform work by persons qualified to produce workmanship of specified quality.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Subcontractor and Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance. In addition comply with the following:
   1. For all trades: Proof of applicable licensing.
   2. Electrical contractors:
   3. Plumbing Contractors:
      c. Gas piping installations: State of Colorado master plumber with minimum 5 years institutional or heavy commercial gas piping experience. Provide an on-site supervisor with a minimum of 3 years of supervisory experience.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
   1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329 or ASTM D 3740 as appropriate; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
   1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
   2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
   4. Authorized to operate in the State of Colorado.
   5. Calibrate testing equipment at reasonable intervals with devices of accuracy traceable to National Bureau of Standards or of accepted values of natural physical constants.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
   1. Contractor responsibilities include the following:
      a. Provide test specimens representative of proposed products and construction.
      b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
      c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
      d. When required, build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
      e. When required, build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
      f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups, as applicable; do not reuse products on Project.
2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect/Engineer, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect/Engineer.
   2. Notify Architect/Engineer seven calendar days in advance of dates and times when mockups will be constructed.
   3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at Project.
   4. Demonstrate the proposed range of aesthetic effects and workmanship.
   5. Obtain Architect/Engineer's approval of mockups before starting work, fabrication, or construction.
      a. Allow seven calendar days for initial review and each re-review of each mockup.
   6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   7. Demolish and remove mockups when directed unless otherwise indicated.

L. Integrated Exterior Mockups: When indicated on Drawings, construct integrated exterior mockup. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.

M. Room Mockups: When indicated on Drawings, construct room mockups incorporating required materials and assemblies, finished according to requirements. Provide required lighting and additional lighting where required to enable Architect/Engineer to evaluate quality of the Work. Provide room mockups of the following rooms:

N. Laboratory Mockups: When required by individual Specification Sections, comply with requirements of preconstruction testing and those specified in individual Specification Sections.

1.9 QUALITY CONTROL

A. University Responsibilities: Where quality-control services are indicated as University's responsibility, University will engage a qualified testing agency to perform these services.
   1. University will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
   2. Payment for these services will be made by the University.
   3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
B. Contractor Responsibilities: Tests and inspections not explicitly assigned to University are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
   1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
   2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
      a. Contractor shall not employ same entity engaged by University, unless agreed to in writing by University.
   3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
   4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
   5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
   6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."

D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

   1. Notify Architect/Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
   2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
   3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
   4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
   5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
   6. Do not perform any duties of Contractor.
G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
   1. Access to the Work.
   2. Incidental labor and facilities necessary to facilitate tests and inspections.
   3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
   4. Facilities for storage and field curing of test samples including, but not limited to, safe storage and proper curing of concrete test cylinders at Project site for first 24 hours after casting as required by ASTM C 31.
   5. Delivery of samples to testing agencies.
   6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
   7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
   1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Manufactured Items and Equipment: Where manufactured products or equipment are required to have representative samples tested, do not use such materials or equipment until tests have been made and the materials or equipment found to be acceptable. Do not incorporate in the work any product which becomes unfit for use after acceptance.

J. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
   1. Distribution: Distribute schedule to University, Architect/Engineer, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: University will engage a qualified testing agency or special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of University, and as follows:
   1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
   2. Notifying Architect/Engineer and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
   3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect/Engineer with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections including instructions received from University. Include the following:
   1. Date test or inspection was conducted.
   2. Description of the Work tested or inspected.
   3. Date test or inspection results were transmitted to Architect/Engineer.
   4. Identification of testing agency or special inspector conducting test or inspection.
   5. Disposition: Pass, fail, nature of defects, if any.
   6. Date and descriptions of remedial or correction action taken.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect/Engineer's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

3.3 SCHEDULE OF INSPECTIONS AND TESTS BY UNIVERSITY

A. University will engage testing agency and pay for testing and inspection associated with the following materials and systems, where included in the Project:
   1. Compaction density of fill and backfill.
   2. Drilled pier end bearing conditions and depths.
4. Precast concrete.
5. Post-tensioned concrete tendons.
7. Structural steel field welds and bolted connections.
8. Spray-applied fireproofing.
10. Asphalitic concrete paving.
11. Foundation drainage systems.
12. Drainage structures and piping.
15. Fluid applied membranes.
16. Thermal imaging.
17. Curtain wall, window, and door field testing.
18. Ceiling hanger wire pull-out.
20. Field sound testing of operable partitions.
22. Fan vibration.

END OF SECTION 01 40 00
SECTION 01 41 00 - REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Building Department Authority.
   2. MS 4 Storm Water and Water Quality Permits
   3. Applicable Codes and Standards.

1.3 BUILDING DEPARTMENT AUTHORITY

A. The University of Colorado Denver is charged with the responsibility of ensuring that provision of applicable codes, standards and guidelines are met on its campuses.

B. The University Denver campus has an established Building Authority responsible to review and examine buildings and plan documents, to permit and inspect construction and/or demolition to ensure conformance to codes adopted by the University and issue certificates of temporary occupancy and occupancy if satisfactory conformance is demonstrated.

C. The authority is executed by the Campus Building Official (CBO) who has the responsibility to perform all the duties set forth in the Current Approved State Buildings Codes and other applicable codes and standards indicated in the “Applicable Codes and Standards” Article of this Section.

D. Permits: Obtain a separate permit for each Project from the Office of the CBO prior to erecting, constructing, enlarging, repairing, moving, removing, converting or demolishing any building or portion thereof. Coordinate and obtain all permits through the University Project Manager. The Contractor is not responsible for costs associated with construction permits.

   1. Exempt work: A building permit is not required for the following:
      a. Fences less than or equal to 6 feet tall.
      b. Movable casework, counters and partitions not over 5 feet 9 inches tall with no electrical or plumbing.
      c. Platforms, walks, and driveways not more than 30 inches above grade and not over any basement or story below.
      d. Painting, papering and similar finish work.
      e. Other work of limited scope at the discretion of the CBO.
E. Permit Issuance: The CBO, or at the discretion of the CBO a third party code consultant, will review application, Drawings, Specifications, computations and other data filed for permit. Complete the permit application with the University Project Manager. Permits require submittal of two (2) stamped, signed sets of Construction Documents, including Drawings, Specifications and all Addenda, and one (1) set of each engineering discipline’s calculations, where such calculations are required. If CBO determines that submittal conforms to the requirements of the Building Code and other applicable codes, standards, laws, regulations and ordinances, an inspection record card will be issued with the building permit. Keep one stamped set of documents on site. The University will keep one stamped set in the Campus Support plan room.

F. Suspension or Revocation of Permit: CBO may, in writing, suspend or revoke a permit issued in error or on the basis of submitted information that is incorrect or that is in violation of the Building Code and other applicable codes and standards.

G. Posting of Permit: Post the Permit in a visible and protected location near the access to the project.

H. Inspection Record Card: Post the Inspection Record Card next to the permit in a visible and protected location near the access to the project. CBO will make required entries based on inspection of the work.

I. Inspection Requests:
   1. Notify CBO that work is ready for inspection two business days before such inspection is desired by telephoning the number posted on the permit. The CBO retains the right to require requests in writing.
   2. A re-inspection fee may be charged for prior rejected items.

J. Construction Inspections:
   1. Contractor is not responsible for costs associated with construction inspections, except re-inspections. The CBO or his/her designee will perform all general building, electrical and plumbing inspections. All construction or work for which a permit is required must remain accessible and exposed for inspection purposes. Provide access to and means for inspection of work.
   2. Site Utilities: Contact and comply with all requirements of City and County of Denver for site utility inspections.
   3. Plumbing and Electrical Inspections: For new buildings and major additions, contact and comply with all requirements of State of Colorado Plumbing and Electrical Boards.
   4. Provisions for structural and other special inspections required by Contract Documents, current approved State Building Codes and University Codes will be provided by the University.

K. Certification of Occupancy:
   1. When CBO inspects the project and finds no violations of any provision of the Building Code, other applicable codes, standards, laws, regulations and ordinances, CBO will issue a Certification of Occupancy (CO) which will contain the following:
      a. Building permit number.
      b. Address of building.
c. Name and address of Owner.
d. Description of building or portion thereof for which certification is issued.
e. Statement that described building or portion thereof has been inspected for compliance with the requirements of the Building Code, other applicable codes, standards, laws, regulations and ordinances, as relates to type of occupancy and use for which the building is intended.

2. Temporary Certificate of Occupancy (TCO): If CBO finds no substantial hazard will result from occupancy of any building or portion thereof before the same is completed, CBO may issue a TCO for the use of a portion or portions of a building or structure prior to the completion of the entire building or structure.

3. Posting of CO: Provide a copy to the University Project Manager and post in a conspicuous location on the premises. CO may not be removed except by CBO upon initial occupancy.

4. Revocation of CO:

1.4 MS4 STORM WATER AND WATER QUALITY PERMITS

A. Obtain necessary State of Colorado and City and County of Denver Permits to the extent that Project impacts site.

1.5 APPLICABLE CODES AND STANDARDS

A. The following approved building codes and standards have been adopted by State Buildings Programs (SBP) as the minimum requirements to be applied to all state-owned buildings and physical facilities including capital construction and controlled maintenance construction projects. Current applicable codes can be obtained from The Office of the State Architect’s website.

B. University of Colorado Denver Codes and Standards: The following codes and standards supplement those indicated on the Office of the State Architect website.


a. Use the most restrictive interpretation where NFPA 101 conflicts with the IBC requirements.


19. OSHA “Occupational Safety and Health Standards” (29 CRF 1910).


21. CDC-NIH Biosafety in Microbiological and Biomedical Laboratories (BMBL); latest edition.


C. Other Standards: As indicated in individual Specification Sections.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 41 00
SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Definitions.
   2. Industry Standards.
   3. Abbreviations and Acronyms.

B. Related Requirements:
   1. Section 01 10 00 “Summary” for an explanation of specification and drawing conventions.
   2. Section 01 41 00 “Regulatory Requirements” for a list of applicable codes.

1.3 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.
   1. Definitions in this Section are not intended to be complete, exhaustive or exclusive. They are general and apply to the Work to the extent that such definitions are not stated more explicitly in other provisions of the Contract Documents.

B. "Approved": When used to convey Architect/Engineer's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect/Engineer's duties and responsibilities as stated in the Conditions of the Contract. Except where expressly indicated, such approval does not release the Contractor from responsibility to fulfill requirements of the Contract Documents.

C. “Backup": N+1 system.

D. "Directed": A command or instruction by Architect/Engineer. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

E. “EHS": Environmental Health and Safety.

F. “Engineer": Architect/Engineer. Other terms including “Mechanical Engineer”, “Electrical Engineer”, or “Structural Engineer” have the same meaning as “Engineer.”
G. “General Conditions”: Contract terms contained in [Contractor’s Agreement Design/Bid/Build, State Form SC-6.21 and The General Conditions of the Construction Contract Design/Bid/Build, State Form SC-6.23] [Construction Manager/General Contractor Agreement CMGC, State Form SC-6.4] [Design/Build Agreement, State Form SC-8.0 and The General Conditions of the Design/Build Agreement, State Form SC-8.1]

H. “General Requirements”: Provisions and requirements of all Division 01 Sections as they apply to all aspects of the Work.

I. “Guarantee”: The narrow definition of the term “warranty” applying to both “warranty” and “guarantee” which terms are used interchangeably.

J. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

K. “Redundant”: 2N system. The level of redundancy is determined by design.

L. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work, whether lawfully imposed by authorities having jurisdiction or not.

M. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

N. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

O. “Owner”: Principal Representative and/or University.

P. "Provide": Furnish and install, complete and ready for the intended use.

Q. “Project Manual”: Bound, printed volume or volumes including Conditions of the Contract and Specifications, which may also include bidding requirements, contract forms, details, schedules, surveys, reports or other relevant items that may or may not be Contract Documents.

R. "Project Site": Space available for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

S. “Supplementary Conditions”: University Special Supplementary General Conditions. Other terms including “Supplementary General Conditions” shall have the same meaning.
1.4 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
   1. Referenced standards take precedence over standards that are not referenced but generally recognized in the construction industry as applicable.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents.
   1. Updated Codes and Standards: Where an applicable code or standard has been revised and reissued after the date of the Contract Documents and before performance of Work affected, submit Contractor-Initiated Change Order Bulletin and Change Order Proposal in accordance with Section 01 26 00 “Contract Modification Procedures” for consideration to modify contract requirements to comply with revised code or standard.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
   1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.
   2. Where required by individual Specification Sections provide and maintain copies of referenced codes and standards at Project Site.
   3. Although copies of standards needed for enforcement of requirements may be part of required submittals, the Architect/Engineer reserves the right to require the Contractor to submit additional copies as necessary for enforcement of requirements.

D. Unreferenced Standards: Unreferenced standards are not directly applicable to the Work, except as a general requirement of whether the Work complies with recognized construction industry standards.

E. Conflicting Requirements: Where compliance with two or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, the most stringent requirement will be enforced, unless the Contract Documents indicate otherwise. Refer requirements that are different, but apparently equal, and uncertainties as to which quality level is more stringent to the Architect/Engineer for a decision before proceeding.

1.5 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
<th>Website</th>
<th>Phone</th>
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<tbody>
<tr>
<td>AABC</td>
<td>Associated Air Balance Council</td>
<td><a href="http://www.aabc.com">www.aabc.com</a></td>
<td>(202) 737-0202</td>
</tr>
<tr>
<td>AAMA</td>
<td>American Architectural Manufacturers Association</td>
<td><a href="http://www.aamanet.org">www.aamanet.org</a></td>
<td>(847) 303-5664</td>
</tr>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
<td><a href="http://www.transportation.org">www.transportation.org</a></td>
<td>(202) 624-5800</td>
</tr>
<tr>
<td>AATCC</td>
<td>American Association of Textile Chemists and Colorists</td>
<td><a href="http://www.aatcc.org">www.aatcc.org</a></td>
<td>(919) 549-8141</td>
</tr>
<tr>
<td>ABMA</td>
<td>American Bearing Manufacturers Association</td>
<td><a href="http://www.americanbearings.org">www.americanbearings.org</a></td>
<td>(202) 367-1155</td>
</tr>
</tbody>
</table>
| ACI     | American Concrete Institute  
(Formerly: ACI International) | [www.concrete.org](http://www.concrete.org) | (248) 848-3700 |
| ACPA    | American Concrete Pipe Association | [www.concrete-pipe.org](http://www.concrete-pipe.org) | (972) 506-7216 |
| AEIC    | Association of Edison Illuminating Companies, Inc.  
(The) | [www.aeic.org](http://www.aeic.org) | (205) 257-2530 |
| AF&ampA| American Forest & Paper Association | [www.afandpa.org](http://www.afandpa.org) | (800) 878-8878  
(202) 463-2700 |
| AGA     | American Gas Association | [www.aga.org](http://www.aga.org) | (202) 824-7000 |
| AHAM    | Association of Home Appliance Manufacturers | [www.aham.org](http://www.aham.org) | (202) 872-5955 |
| AHRI    | Air-Conditioning, Heating, and Refrigeration Institute  
(The) | [www.ahrinet.org](http://www.ahrinet.org) | (703) 524-8800 |
| AI      | Asphalt Institute | [www.asphaltinstitute.org](http://www.asphaltinstitute.org) | (859) 288-4960 |
| AIA     | American Institute of Architects (The) | [www.aia.org](http://www.aia.org) | (800) 242-3837  
(202) 626-7300 |
| AISC    | American Institute of Steel Construction | [www.aisc.org](http://www.aisc.org) | (800) 644-2400  
(312) 670-2400 |
<p>| AISI    | American Iron and Steel Institute | <a href="http://www.steel.org">www.steel.org</a> | (202) 452-7100 |</p>
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<tr>
<th>Acronym</th>
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<tr>
<td>AITC</td>
<td>American Institute of Timber Construction</td>
<td>(303) 792-9559</td>
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<tr>
<td>AMCA</td>
<td>Air Movement and Control Association International, Inc.</td>
<td>(847) 394-0150</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
<td>(202) 293-8020</td>
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<tr>
<td>AOSA</td>
<td>Association of Official Seed Analysts, Inc.</td>
<td>(607) 256-3313</td>
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<tr>
<td>APA</td>
<td>APA - The Engineered Wood Association</td>
<td>(253) 565-6600</td>
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<tr>
<td>APA</td>
<td>Architectural Precast Association</td>
<td>(239) 454-6989</td>
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<tr>
<td>API</td>
<td>American Petroleum Institute</td>
<td>(202) 682-8000</td>
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<tr>
<td>ARI</td>
<td>Air-Conditioning &amp; Refrigeration Institute</td>
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<tr>
<td>ARMA</td>
<td>Asphalt Roofing Manufacturers Association</td>
<td>(202) 207-0917</td>
</tr>
<tr>
<td>ASCE</td>
<td>American Society of Civil Engineers</td>
<td>(800) 548-2723</td>
</tr>
<tr>
<td>ASCE/SEI</td>
<td>American Society of Civil Engineers/Structural Engineering Institute</td>
<td>(703) 295-6300</td>
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<tr>
<td>ASHRAE</td>
<td>American Society of Heating, Refrigerating and Air-Conditioning Engineers</td>
<td>(800) 527-4723</td>
</tr>
<tr>
<td>ASME</td>
<td>ASME International (American Society of Mechanical Engineers)</td>
<td>(800) 843-2763</td>
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<tr>
<td>ASSE</td>
<td>American Society of Safety Engineers (The)</td>
<td>(847) 699-2929</td>
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<tr>
<td>ASSE</td>
<td>American Society of Sanitary Engineering</td>
<td>(440) 835-3040</td>
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</table>
www.asse-plumbing.org

ASTM  ASTM International
       (American Society for Testing and Materials International)
       www.astm.org

(610) 832-9500

ATIS  Alliance for Telecommunications Industry Solutions
      www.atis.org

(202) 628-6380

AWEA  American Wind Energy Association
      www.awea.org

(202) 383-2500

AWI  Architectural Woodwork Institute
     www.awinet.org

(571) 323-3636

AWMAC  Architectural Woodwork Manufacturers Association of Canada
       www.awmac.com

(403) 453-7387

AWPA  American Wood Protection Association
      (Formerly: American Wood-Preservers' Association)
      www.awpa.com

(205) 733-4077

AWS  American Welding Society
     www.aws.org

(800) 443-9353
     (305) 443-9353

AWWA  American Water Works Association
      www.awwa.org

(800) 926-7337
     (303) 794-7711

BHMA  Builders Hardware Manufacturers Association
      www.buildershardware.com

(212) 297-2122

BIA  Brick Industry Association (The)
     www.gobrick.com

(703) 620-0010

BICSI  BICSI, Inc.
       www.bicsi.org

(800) 242-7405
     (813) 979-1991

BIFMA  BIFMA International
       (Business and Institutional Furniture Manufacturer's Association)
       www.bifma.com

(616) 285-3963

BISCC  Baking Industry Sanitation Standards Committee
       www.biscc.org

(866) 342-4772

BOCA  BOCA
      (Building Officials and Code Administrators International Inc.)
      (See ICC)
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Organization Name</th>
<th>Additional Information</th>
<th>Phone Number(s)</th>
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<tr>
<td>BWF</td>
<td>Badminton World Federation</td>
<td>(Formerly: International Badminton Federation) <a href="http://www.bwfbadminton.org">www.bwfbadminton.org</a></td>
<td>60 3 9283 7155</td>
</tr>
<tr>
<td>CDA</td>
<td>Copper Development Association</td>
<td><a href="http://www.copper.org">www.copper.org</a></td>
<td>(800) 232-3282, (212) 251-7200</td>
</tr>
<tr>
<td>CEA</td>
<td>Canadian Electricity Association</td>
<td><a href="http://www.electricity.ca">www.electricity.ca</a></td>
<td>(613) 230-9263</td>
</tr>
<tr>
<td>CEA</td>
<td>Consumer Electronics Association</td>
<td><a href="http://www.ce.org">www.ce.org</a></td>
<td>(866) 858-1555, (703) 907-7600</td>
</tr>
<tr>
<td>CFFA</td>
<td>Chemical Fabrics &amp; Film Association, Inc.</td>
<td><a href="http://www.chemicalfabricsandfilm.com">www.chemicalfabricsandfilm.com</a></td>
<td>(216) 241-7333</td>
</tr>
<tr>
<td>CFSEI</td>
<td>Cold-Formed Steel Engineers Institute</td>
<td><a href="http://www.cfsei.org">www.cfsei.org</a></td>
<td>(866) 465-4732, (202) 263-4488</td>
</tr>
<tr>
<td>CGA</td>
<td>Compressed Gas Association</td>
<td><a href="http://www.cganet.com">www.cganet.com</a></td>
<td>(703) 788-2700</td>
</tr>
<tr>
<td>CIMA</td>
<td>Cellulose Insulation Manufacturers Association</td>
<td><a href="http://www.cellulose.org">www.cellulose.org</a></td>
<td>(888) 881-2462, (937) 222-2462</td>
</tr>
<tr>
<td>CISCA</td>
<td>Ceilings &amp; Interior Systems Construction Association</td>
<td><a href="http://www.cisca.org">www.cisca.org</a></td>
<td>(630) 584-1919</td>
</tr>
<tr>
<td>CISPI</td>
<td>Cast Iron Soil Pipe Institute</td>
<td><a href="http://www.cispi.org">www.cispi.org</a></td>
<td>(404) 622-0073</td>
</tr>
<tr>
<td>CLFMI</td>
<td>Chain Link Fence Manufacturers Institute</td>
<td><a href="http://www.chainlinkinfo.org">www.chainlinkinfo.org</a></td>
<td>(301) 596-2583</td>
</tr>
<tr>
<td>CPA</td>
<td>Composite Panel Association</td>
<td><a href="http://www.pbmdf.com">www.pbmdf.com</a></td>
<td>(703) 724-1128</td>
</tr>
<tr>
<td>CRI</td>
<td>Carpet and Rug Institute (The)</td>
<td><a href="http://www.carpet-rug.org">www.carpet-rug.org</a></td>
<td>(706) 278-3176</td>
</tr>
<tr>
<td>CRRC</td>
<td>Cool Roof Rating Council</td>
<td><a href="http://www.coolroofs.org">www.coolroofs.org</a></td>
<td>(866) 465-2523, (510) 485-7175</td>
</tr>
<tr>
<td>CRSI</td>
<td>Concrete Reinforcing Steel Institute</td>
<td><a href="http://www.crsi.org">www.crsi.org</a></td>
<td>(800) 328-6306, (847) 517-1200</td>
</tr>
<tr>
<td>CSA</td>
<td>Canadian Standards Association</td>
<td><a href="http://www.csa.ca">www.csa.ca</a></td>
<td>(800) 463-6727, (416) 747-4000</td>
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<tr>
<td>CSA</td>
<td>CSA International</td>
<td></td>
<td>(866) 797-4272</td>
</tr>
</tbody>
</table>
(Formerly: IAS - International Approval Services) www.csa-international.org

CSI  Construction Specifications Institute (The) www.csinet.org

(800) 689-2900

(703) 684-0300

CSSB  Cedar Shake & Shingle Bureau www.cedarbureau.org

(604) 820-7700

CTI  Cooling Technology Institute
(Formerly: Cooling Tower Institute) www.cti.org

(281) 583-4087

CWC  Composite Wood Council
(See CPA)

DASMA  Door and Access Systems Manufacturers Association www.dasma.com

(216) 241-7333

DHI  Door and Hardware Institute www.dhi.org

(703) 222-2010

ECA  Electronic Components Association www.ec-central.org

(703) 907-8024

ECAMA  Electronic Components Assemblies & Materials Association
(See ECA)

EIA  Electronic Industries Alliance
(See TIA)

EIMA  EIFS Industry Members Association www.eima.com

(800) 294-3462

(703) 538-1616

EJMA  Expansion Joint Manufacturers Association, Inc. www.ejma.org

(914) 332-0040

ESD  ESD Association
(Electrostatic Discharge Association) www.esda.org

(315) 339-6937

ESTA  Entertainment Services and Technology Association
(See PLASA)

EVO  Efficiency Valuation Organization www.evo-world.org

(415) 367-3643

44 20 88 167 857

FIBA  Fédération Internationale de Basketball
(The International Basketball Federation) www.fiba.com

41 22 545 00 00
<table>
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<tr>
<th>Acronym</th>
<th>Description</th>
<th>Phone/Website</th>
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<tr>
<td>FIVB</td>
<td>Fédération Internationale de Volleyball (The International Volleyball Federation)</td>
<td>41 21 345 35 45, <a href="http://www.fivb.org">www.fivb.org</a></td>
</tr>
<tr>
<td>FM Approvals</td>
<td>FM Approvals LLC</td>
<td>(781) 762-4300, <a href="http://www.fmglobal.com">www.fmglobal.com</a></td>
</tr>
<tr>
<td>FSA</td>
<td>Fluid Sealing Association</td>
<td>(610) 971-4850, <a href="http://www.fluidsealing.com">www.fluidsealing.com</a></td>
</tr>
<tr>
<td>GA</td>
<td>Gypsum Association</td>
<td>(301) 277-8686, <a href="http://www.gypsum.org">www.gypsum.org</a></td>
</tr>
<tr>
<td>GANA</td>
<td>Glass Association of North America</td>
<td>(785) 271-0208, <a href="http://www.glasswebsite.com">www.glasswebsite.com</a></td>
</tr>
<tr>
<td>GS</td>
<td>Green Seal</td>
<td>(202) 872-6400, <a href="http://www.greenseal.org">www.greenseal.org</a></td>
</tr>
<tr>
<td>HI</td>
<td>Hydraulic Institute</td>
<td>(973) 267-9700, <a href="http://www.pumps.org">www.pumps.org</a></td>
</tr>
<tr>
<td>HI/GAMA</td>
<td>Hydronics Institute/Gas Appliance Manufacturers Association (See AHR!)</td>
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<tr>
<td>HMMA</td>
<td>Hollow Metal Manufacturers Association (See NAAMM)</td>
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</tr>
<tr>
<td>HPVA</td>
<td>Hardwood Plywood &amp; Veneer Association</td>
<td>(703) 435-2900, <a href="http://www.hpva.org">www.hpva.org</a></td>
</tr>
<tr>
<td>HPW</td>
<td>H. P. White Laboratory, Inc.</td>
<td>(410) 838-6550, <a href="http://www.hpwhite.com">www.hpwhite.com</a></td>
</tr>
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</table>
IAS  International Approval Services
    (See CSA)

ICBO  International Conference of Building Officials
    (See ICC)

ICC  International Code Council
    www.iccsafe.org
    (888) 422-7233
    (202) 370-1800

ICEA  Insulated Cable Engineers Association, Inc.
    www.icea.net
    (770) 830-0369

ICPA  International Cast Polymer Alliance
    www.icpa-hq.org
    (703) 525-0511

ICRI  International Concrete Repair Institute, Inc.
    www.icri.org
    (847) 827-0830

IEC  International Electrotechnical Commission
    www.iec.ch
    41 22 919 02 11

IEEE  Institute of Electrical and Electronics Engineers, Inc.
    (The)
    www.ieee.org
    (212) 419-7900

IES  Illuminating Engineering Society
    (Formerly: Illuminating Engineering Society of North America)
    www.ies.org
    (212) 248-5000

IESNA  Illuminating Engineering Society of North America
    (See IES)

IEST  Institute of Environmental Sciences and Technology
    www.iest.org
    (847) 981-0100

IGMA  Insulating Glass Manufacturers Alliance
    www.igmaonline.org
    (613) 233-1510

IGSHPA  International Ground Source Heat Pump Association
    www.igshpa.okstate.edu
    (405) 744-5175

ILI  Indiana Limestone Institute of America, Inc.
    www.illiai.com
    (812) 275-4426

Intertek  Intertek Group
    (Formerly: ETL SEMCO; Intertek Testing Service NA)
    www.intertek.com
    (800) 967-5352

ISA  International Society of Automation (The)
    (Formerly: Instrumentation, Systems, and Automation
    (919) 549-8411

01 42 00 - 10
References
Society
www.isa.org

ISAS Instrumentation, Systems, and Automation Society (The)
(See ISA)

ISFA International Surface Fabricators Association
(Formerly: International Solid Surface Fabricators Association)
www.isfanow.org

ISO International Organization for Standardization
www.iso.org

41 22 749 01 11

ISSFA International Solid Surface Fabricators Association
(See ISFA)

ITU International Telecommunication Union
www.itu.int/home

41 22 730 51 11

KCMA Kitchen Cabinet Manufacturers Association
www.kcma.org

41 22 749 01 11

LMA Laminating Materials Association
(See CPA)

LPI Lightning Protection Institute
www.lightning.org

41 22 749 01 11

(800) 488-6864

MBMA Metal Building Manufacturers Association
www.mbma.com

41 22 749 01 11

(216) 241-7333

MCA Metal Construction Association
www.metalconstruction.org

(847) 375-4718

MFMA Maple Flooring Manufacturers Association, Inc.
www.maplefloor.org

(888) 480-9138

MFMA Metal Framing Manufacturers Association, Inc.
www.metalframingmfg.org

(312) 644-6610

MHIA Material Handling Industry of America
www.mhia.org

(800) 345-1815

(704) 676-1190

MIA Marble Institute of America
www.marble-institute.com

(440) 250-9222

MMPA Moulding & Millwork Producers Association
(Formerly: Wood Moulding & Millwork Producers Association)

(800) 550-7889

(530) 661-9591

References
www.wmmpa.com

MPI  Master Painters Institute  (888) 674-8937
www.paintinfo.com  (604) 298-7578

MSS  Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
www.mss-hq.org  (703) 281-6613

NAAMM  National Association of Architectural Metal Manufacturers
www.naamm.org  (630) 942-6591

NACE  NACE International
(National Association of Corrosion Engineers International)
www.nace.org  (800) 797-6223
(281) 228-6200

NADCA  National Air Duct Cleaners Association
www.nadca.com  (202) 737-2926

NAIMA  North American Insulation Manufacturers Association
www.naima.org  (703) 684-0084

NBGQA  National Building Granite Quarries Association, Inc.
www.nbgqa.com  (800) 557-2848

NCAA  National Collegiate Athletic Association (The)
www.ncaa.org  (317) 917-6222

NCMA  National Concrete Masonry Association
www.ncma.org  (703) 713-1900

NEBB  National Environmental Balancing Bureau
www.nebb.org  (301) 977-3698

NECA  National Electrical Contractors Association
www.necanet.org  (301) 657-3110

NeLMA  Northeastern Lumber Manufacturers Association
www.nelma.org  (207) 829-6901

NEMA  National Electrical Manufacturers Association
www.nema.org  (703) 841-3200

NETA  InterNational Electrical Testing Association
www.netaworld.org  (888) 300-6382
(269) 488-6382

NFHS  National Federation of State High School Associations
www.nfhs.org  (317) 972-6900
NFPA  NFPA  (National Fire Protection Association)
   www.nfpa.org  
NFPA  NFPA International  (See NFPA)
NFRC  National Fenestration Rating Council
   www.nfrc.org  
NHLA  National Hardwood Lumber Association
   www.nhla.com  
NLGA  National Lumber Grades Authority
   www.nlga.org  
NOFMA  National Oak Flooring Manufacturers Association  (See NWFA)
NOMMA  National Ornamental & Miscellaneous Metals Association
   www.nomma.org  
NRCA  National Roofing Contractors Association
   www.nrca.net  
NRMCA  National Ready Mixed Concrete Association
   www.nrmca.org  
NSF  NSF International  (National Sanitation Foundation International)
   www.nsf.org  
NSPE  National Society of Professional Engineers
   www.nspe.org  
NSSGA  National Stone, Sand & Gravel Association
   www.nssga.org  
NTMA  National Terrazzo & Mosaic Association, Inc. (The)
   www.ntma.com  
NWFA  National Wood Flooring Association
   www.nwfa.org  
PCI  Precast/Prestressed Concrete Institute
   www pci.org  
PDI  Plumbing & Drainage Institute
   www.pdionline.org
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<th>Acronym</th>
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<tr>
<td>PLASA</td>
<td>PLASA (Formerly: ESTA - Entertainment Services and Technology Association)</td>
<td>(212) 244-1505</td>
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<tr>
<td>RCSC</td>
<td>Research Council on Structural Connections</td>
<td></td>
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<td>RFI</td>
<td>Resilient Floor Covering Institute</td>
<td>(706) 882-3833</td>
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<td>RIS</td>
<td>Redwood Inspection Service</td>
<td>(925) 935-1499</td>
</tr>
<tr>
<td>SAE</td>
<td>SAE International (Society of Automotive Engineers)</td>
<td>(877) 606-7323 (724) 776-4841</td>
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<td>SBCCI</td>
<td>Southern Building Code Congress International, Inc. (See ICC)</td>
<td></td>
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<td>SCTE</td>
<td>Society of Cable Telecommunications Engineers</td>
<td>(800) 542-5040 (610) 363-6888</td>
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<td>SDI</td>
<td>Steel Deck Institute</td>
<td>(847) 458-4647</td>
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<td>SDI</td>
<td>Steel Door Institute</td>
<td>(440) 899-0010</td>
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<tr>
<td>SEFA</td>
<td>Scientific Equipment and Furniture Association</td>
<td>(877) 294-5424 (516) 294-5424</td>
</tr>
<tr>
<td>SEI/ASCE</td>
<td>Structural Engineering Institute/American Society of Civil Engineers</td>
<td></td>
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<td>SIA</td>
<td>Security Industry Association</td>
<td>(866) 817-8888 (703) 683-2075</td>
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<tr>
<td>SJI</td>
<td>Steel Joist Institute</td>
<td>(843) 293-1995</td>
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<td>SMA</td>
<td>Screen Manufacturers Association</td>
<td>(773) 636-0672</td>
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<td>SMACNA</td>
<td>Sheet Metal and Air Conditioning Contractors' National Association</td>
<td>(703) 803-2980</td>
</tr>
<tr>
<td>SMPTE</td>
<td>Society of Motion Picture and Television Engineers</td>
<td>(914) 761-1100</td>
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www.smpte.org

SPFA  Spray Polyurethane Foam Alliance  www.sprayfoam.org  (800) 523-6154

SPIB  Southern Pine Inspection Bureau  www.spib.org  (850) 434-2611

SPRI  Single Ply Roofing Industry  www.spri.org  (781) 647-7026


SSINA  Specialty Steel Industry of North America  www.ssina.com  (800) 982-0355  (202) 342-8630

SSPC  SSPC: The Society for Protective Coatings  www.sspc.org  (877) 281-7772  (412) 281-2331

STI  Steel Tank Institute  www.steeltank.com  (847) 438-8265

SWI  Steel Window Institute  www.steelwindows.com  (216) 241-7333

SWPA  Submersible Wastewater Pump Association  www.swpa.org  (847) 681-1868

TCA  Tilt-Up Concrete Association  www.tilt-up.org  (319) 895-6911

TCNA  Tile Council of North America, Inc.  (Formerly: Tile Council of America)  www.tileusa.com  (864) 646-8453

TEMA  Tubular Exchanger Manufacturers Association, Inc.  www.tema.org  (914) 332-0040

TIA  Telecommunications Industry Association  (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance)  www.tiaonline.org  (703) 907-7700

TIA/EIA  Telecommunications Industry Association/Electronic Industries Alliance  (See TIA)

TMS  The Masonry Society  www.masonrysociety.org  (303) 939-9700

References
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<td>TPI</td>
<td>Truss Plate Institute</td>
<td><a href="http://www.tpinst.org">www.tpinst.org</a></td>
<td>(703) 683-1010</td>
</tr>
<tr>
<td>TPI</td>
<td>Turfgrass Producers International</td>
<td><a href="http://www.turfgrasssod.org">www.turfgrasssod.org</a></td>
<td>(800) 405-8873 (847) 649-5555</td>
</tr>
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<td>TRI</td>
<td>Tile Roofing Institute</td>
<td><a href="http://www.tileroofing.org">www.tileroofing.org</a></td>
<td>(312) 670-4177</td>
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<tr>
<td>UBC</td>
<td>Uniform Building Code (See ICC)</td>
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<td>UL</td>
<td>Underwriters Laboratories Inc.</td>
<td><a href="http://www.ul.com">www.ul.com</a></td>
<td>(877) 854-3577</td>
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<td>UNI</td>
<td>Uni-Bell PVC Pipe Association</td>
<td><a href="http://www.uni-bell.com">www.uni-bell.com</a></td>
<td>(972) 243-3902</td>
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<td>USAV</td>
<td>USA Volleyball</td>
<td><a href="http://www.usavolleyball.org">www.usavolleyball.org</a></td>
<td>(888) 786-5539 (719) 228-6800</td>
</tr>
<tr>
<td>USGBC</td>
<td>U.S. Green Building Council</td>
<td><a href="http://www.usgbc.org">www.usgbc.org</a></td>
<td>(800) 795-1747</td>
</tr>
<tr>
<td>USITT</td>
<td>United States Institute for Theatre Technology, Inc.</td>
<td><a href="http://www.usitt.org">www.usitt.org</a></td>
<td>(800) 938-7488 (315) 463-6463</td>
</tr>
<tr>
<td>WASTEC</td>
<td>Waste Equipment Technology Association</td>
<td><a href="http://www.wastec.org">www.wastec.org</a></td>
<td>(800) 424-2869 (202) 244-4700</td>
</tr>
<tr>
<td>WCLIB</td>
<td>West Coast Lumber Inspection Bureau</td>
<td><a href="http://www.wclib.org">www.wclib.org</a></td>
<td>(800) 283-1486 (503) 639-0651</td>
</tr>
<tr>
<td>WCMA</td>
<td>Window Covering Manufacturers Association</td>
<td><a href="http://www.wcmanet.org">www.wcmanet.org</a></td>
<td>(212) 297-2122</td>
</tr>
<tr>
<td>WDMA</td>
<td>Window &amp; Door Manufacturers Association</td>
<td><a href="http://www.wdma.com">www.wdma.com</a></td>
<td>(800) 223-2301 (312) 321-6802</td>
</tr>
<tr>
<td>WI</td>
<td>Woodwork Institute</td>
<td>(Formerly: WIC - Woodwork Institute of California) <a href="http://www.wicnet.org">www.wicnet.org</a></td>
<td>(916) 372-9943</td>
</tr>
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<td>WMMPA</td>
<td>Wood Moulding &amp; Millwork Producers Association</td>
<td>(See MMPA)</td>
<td></td>
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<td>WSRCA</td>
<td>Western States Roofing Contractors Association</td>
<td><a href="http://www.wsrca.com">www.wsrca.com</a></td>
<td>(800) 725-0333 (650) 938-5441</td>
</tr>
<tr>
<td>WWPA</td>
<td>Western Wood Products Association</td>
<td><a href="http://www.wwpa.org">www.wwpa.org</a></td>
<td>(503) 224-3930</td>
</tr>
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</table>
B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

DIN  Deutsches Institut für Normung e.V.  49 30 2601-0
     www.din.de

IAPMO International Association of Plumbing and Mechanical
   Officials  (909) 472-4100
     www.iapmo.org

ICC  International Code Council  (888) 422-7233
     www.iccsafe.org

ICC-ES ICC Evaluation Service, LLC  (800) 423-6587
      www.icc-es.org  (562) 699-0543

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

COE  Army Corps of Engineers  (202) 761-0011
     www.usace.army.mil

CPSC  Consumer Product Safety Commission  (800) 638-2772
     www.cpsc.gov  (301) 504-7923

DOC  Department of Commerce  (301) 975-4040
     National Institute of Standards and Technology
     www.nist.gov

DOD  Department of Defense  (215) 697-2664
     http://dodssp.daps.dla.mil

DOE  Department of Energy  (202) 586-9220
     www.energy.gov

EPA  Environmental Protection Agency  (202) 272-0167
     www.epa.gov

FAA  Federal Aviation Administration  (866) 835-5322
     www.faa.gov

     www.gpo.gov
<table>
<thead>
<tr>
<th>Agency</th>
<th>Contact Information</th>
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</table>
| GSA                    | General Services Administration  
  www.gsa.gov  
  (800) 488-3111  
  (202) 619-8925 |
| HUD                    | Department of Housing and Urban Development  
  www.hud.gov  
  (202) 708-1112 |
| LBL                    | Lawrence Berkeley National Laboratory  
  Environmental Energy Technologies Division  
  http://eetd.lbl.gov  
  (510) 486-4000 |
| OSHA                   | Occupational Safety & Health Administration  
  www.osha.gov  
  (800) 321-6742 |
| SD                     | Department of State  
  www.state.gov  
  (202) 647-4000 |
| TRB                    | Transportation Research Board  
  National Cooperative Highway Research Program  
  www.trb.org  
  (202) 334-2934 |
| USDA                   | Department of Agriculture  
  Agriculture Research Service  
  U.S. Salinity Laboratory  
  www.ars.usda.gov  
  (202) 720-3656 |
| USDA                   | Department of Agriculture  
  Rural Utilities Service  
  www.usda.gov  
  (202) 720-2791 |
| USDJ                   | Department of Justice  
  Office of Justice Programs  
  National Institute of Justice  
  www.ojp.usdoj.gov  
  (202) 307-0703 |
| USP                    | U.S. Pharmacopeia  
  www.usp.org  
  (800) 227-8772  
  (301) 881-0666 |
| USPS                   | United States Postal Service  
  www.usps.com  
  (202) 268-2000 |

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and Web sites are subject to change and are believed to be accurate and up-to-date as of the date of the Contract Documents.

| CFR                    | Code of Federal Regulations  
  Available from Government Printing Office  
  www.gpo.gov/fdsys  
  (866) 512-1800  
  (202) 512-1800 |
DOD  Department of Defense
Military Specifications and Standards
Available from Department of Defense Single Stock Point
http://dodssp.daps.dla.mil

(215) 697-2664

DSCC  Defense Supply Center Columbus
(See FS)

FED-STD  Federal Standard
(See FS)

FS  Federal Specification
Available from Department of Defense Single Stock Point
http://dodssp.daps.dla.mil

Available from Defense Standardization Program
www.dsp.dla.mil

Available from General Services Administration
www.gsa.gov
(800) 488-3111
(202) 619-8925

Available from National Institute of Building Sciences/Whole Building Design Guide
www.wbdg.org/ccb
(202) 289-7800

MILSPE  Military Specification and Standards
(See DOD)

USAB  United States Access Board
www.access-board.gov
(800) 872-2253
(202) 272-0080

USATBC  U.S. Architectural & Transportation Barriers Compliance Board
(See USAB)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00
SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
   1. Nothing in this Section is intended to limit types and amounts of temporary work required, and no omission from this Section will be recognized as an indication by Architect/Engineer that such temporary activity is not required for successful completion of the Work. The use of alternative facilities equivalent to those specified is the Contractor's option, subject to Architect/Engineer's and University acceptance.

B. Related Requirements:
   1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.
   2. Section 01 35 46 "Indoor Air Quality" for temporary facility work including HVAC, air filtration, moisture management, air filtration and dust control partitions required to comply with indoor air quality requirements during construction.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, University's construction forces, Architect/Engineer, testing agencies, and authorities having jurisdiction.

B. Use Charges: As follows:
   1. For new construction: Arrange for and pay for water, sewer, electric power, steam and chilled water use charges for utility usage by all entities for construction operations.
   2. For renovations of existing facilities: Arrange for and University will pay for all use charges.

C. Temporary Metering: For all utility connection; sub-meter at point of connection to existing systems.
1. Temporary utility meter must be approved by University Campus Energy Engineer.
2. Meters shall be operational prior to any use of utility for temporary heating.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

B. Erosion- and Sedimentation-Control Plan: Show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

C. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
   1. Locations of dust-control partitions at each phase of work.
   2. HVAC system isolation schematic drawing.
   3. Location of proposed air-filtration system discharge.
   5. Other dust-control measures.

1.5 QUALITY ASSURANCE

A. General: Comply with governing regulations and utility company regulations and recommendations for the construction of temporary facilities including, but not necessarily limited to, code compliances, permits, inspections, testing, health, safety, pollution and environmental compliances.


D. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

E. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

F. Accessible Temporary Egress: Where temporary accessible egress from existing buildings or portions thereof is provided, comply with applicable provisions in the U.S.
1.6 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before University's acceptance, regardless of previously assigned responsibilities.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide both new or used materials and equipment for temporary facilities, which are in substantially undamaged and serviceable condition. Provide types and qualities which are recognized in the construction industry as suitable for the intended use in each application. Comply with Utility Company requirements as applicable.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Insulated, weather-tight, of sufficient size to accommodate needs of University, Architect/Engineer, and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.

C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
   1. Store combustible materials apart from building.
   2. Comply with Section 01 10 00 “Summary” for use of site for staging areas.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. Digital Camera: Minimum 12 megapixel; available in field office for use.
C. Thermometer: Outdoor, re-settable type indicating daily maximum and minimum temperatures.
   1. Locate in a shaded-from-the-sun, conveniently readable location that will give reasonably accurate readings of the actual air temperature and be reached easily for resetting.

D. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate, expand and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

C. Use qualified workers for the installation of temporary facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.
   1. Arrange with utility company, University, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services. Comply with requirements in Section 01 10 00 “Summary” for existing utility disruption procedures.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction. Where available, connect to University's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to University. At Substantial Completion, restore these facilities to condition existing before initial use.
   1. Obtain and pay for all required water taps.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
   1. Toilets: Use of University's existing toilet facilities is not permitted.
2. Provide temporary toilets within available site area in location approved by University which will best serve the needs of construction personnel.
3. Supply and maintain toilet tissue, paper towels, paper cups and similar disposable materials as appropriate for each sanitary facility, and provide appropriate waste paper containers for used materials.
4. At Contractor’s option, provide drinking water for construction personnel by either water-system-connected drinking fountains or by containerized tap dispensers with paper cups (or both).

E. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
   1. HVAC Equipment: Unless University authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
      a. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
      b. Heating Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
      c. Permanent HVAC System: If University authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air and exhaust grille in system and remove at end of construction. Clean and adjust HVAC system and put in new condition before Completion as required in Section 01 77 00 “Closeout Procedures”.

F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
   1. Prior to commencing work, isolate the HVAC system in area where work is to be performed.
      a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
      b. Maintain negative air pressure within work area using HEPA-equipped airfiltration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
   2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
   3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.

G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.

H. Electric Power Service: Provide weatherproof, grounded, electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations. Include, as required, transformers, overload protected disconnects, automatic ground fault interrupters and main distribution switchgear. Maintain equipment in a condition acceptable to University.
1. Install electric power service overhead unless otherwise indicated.
2. Where available capacity exists in existing system, connect temporary service to University's existing power source, as directed by University.
3. Provide separate connection for power and for lighting.
4. Provide sufficient 220v outlets for special tools, welding equipment and similar devices requiring such service at locations where required.
5. Provide sufficient circuits and duplex 120v single phase outlets so located that any part of the work can be reached with a 75 foot extension cord to accommodate normal power tools and supplemental lighting.

I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
1. Provide temporary light to levels and as required by governing regulations but not less than minimum 5 foot-candle illumination in all areas accessible to workers during hours they are at the job; minimum 10 foot-candles for shop areas; 20 foot-candles or more where detailed or finishing work is being done, supplemented as may be required.
2. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
3. Install lighting for Project identification sign.
4. Where permanent light fixtures have been used for temporary lighting, supply temporary lamps and replace with new lamps at time of Completion.
5. Provide lighting in stairways and exits at all times.

J. Telephone Service: Provide temporary telephone service in Contractor's field office and distribute to each work station.
1. Pay for line installation, monthly charges, and expenses necessary to extend service from minimum point of presence (MPOP) as determined by University I/S.
2. Provide temporary telephone service in common-use facilities for use by all construction personnel.
3. Provide answering machine and a dedicated telephone line for a facsimile machine.
4. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:
1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect/Engineer schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to University.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings.
   1. Surface temporary access road with road base material of not less than 4 inch thickness and compact.
   2. Provide temporary signage and temporary pedestrian accessways or other special considerations necessary for continued University operations.
   3. Provide stop sign(s) at all points of egress from construction site to meet standards established in the Manual of Uniform Traffic Code Devices (MUTCD).
   4. Maintain University access to areas affected by temporary access roads during inclement weather.
   5. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.
   6. Restore to original condition to satisfaction of University when no longer required.

C. Temporary Walks: Construct and maintain temporary walks around the construction work and to offices, toilets and similar locations on the site.

D. Traffic Controls: Comply with requirements of authorities having jurisdiction.
   1. Protect existing site improvements to remain including curbs, pavement, and utilities.
   2. Maintain access for fire-fighting equipment and access to fire hydrants.

E. Parking: Comply with requirements in Section 01 10 00 “Summary.”

F. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
   1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
   2. Remove snow and ice as required to minimize accumulations.

G. Project Signs: Provide Project signs at locations indicated or directed. Unauthorized signs are not permitted.

H. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
   1. Obtain necessary permits and approvals from City and County of Denver.
   2. Provide waste chutes as required in accordance with applicable laws and regulations.
I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel. The selection of type, size and number of hoisting facilities is the sole responsibility of the Contractor.
   1. Truck cranes and similar devices used for hoisting materials are considered “tools and equipment” and not temporary facilities.

J. Temporary Elevator Use: Use of elevators is not permitted without prior written approval of the Architect/Engineer and University Project Manager.
   1. If so approved, only one designated elevator may be used subject to the requirements of “Existing Elevator Use” paragraph below.

K. Existing Elevator Use: When approved by University, one designated existing elevator may be used at no charge to Contractor or other subcontractors for transporting personnel, small tools, materials, and equipment. Comply with requirements of Section 01 10 00 “Summary” and the following:
   1. Contractor will not be granted exclusive use of the designated elevator. University personnel and staff will be permitted to use this elevator as their work duties require.
   2. Entire car is lined (floor, walls, ceiling) with 3/4 inch Fir plywood or equivalent.
   3. Total load carried does not exceed rated capacity of elevator.
   4. No materials, equipment, trash, tools or other items too large to be readily moved into and out of the car may be carried in the elevator.
   5. Before acceptance of the building, linings are removed; all exposed surfaces are in new condition; all controls, relays, other parts showing any wear have been replaced.
   6. Entire elevator, including machinery, electrical components, doors, operators and controls shall be tested, adjusted, and put in new condition with specified warranties and maintenance to take effect at date of Completion Certificate.
   7. Written clearance has been obtained from the Elevator Service Company stating that the installation is safe and complete for this use prior to using it.
   8. The Contractor signs the Elevator Service Company’s standard agreement and release forms for this usage and pays charges for maintenance, service, repairs, and reconditioning.

L. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.

M. Existing Stair Usage: Use of University's existing stairs will be permitted, provided stairs are cleaned and maintained in a condition acceptable to University. At Substantial Completion, restore stairs to condition existing before initial use.
   1. Provide protective coverings, barriers, devices, signs, or other procedures to protect stairs and to maintain means of egress. If stairs become damaged, restore damaged areas so no evidence remains of correction work.

N. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.
3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Protection of Work: Protect in-progress and completed work from damage or deterioration, other than normal weathering of exposed materials, through construction duration until completion, as appropriate and as recommended by manufacturer and Installer.
   1. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings. Protect finished floors and stairs from traffic, movement of heavy objects, and storage.
   2. Prohibit traffic and storage on waterproofed and roofed surfaces, on lawn and landscaped areas.
   3. Always protect excavation, trenches, and building, from damage from rain water, spring water, ground water, backing up of drains or sewers. Provide pumps, equipment, enclosures, to provide this protection.
   4. Remove protective coverings and materials at the appropriate time but no later than final cleaning operations.

C. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
   1. Comply with work restrictions specified in Section 01 10 00 "Summary."

D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
   1. Comply with Section 01 41 00 “Regulatory Requirements” Article “MS4 Storm Water and Water Quality Permits.”
   2. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
   3. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
   4. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
   5. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

E. Stormwater Control: Comply with Section 01 41 00 “Regulatory Requirements” Article “MS4 Storm Water and Water Quality Permits.”

F. Tree and Plant Protection: Install temporary fencing or guard located outside the drip line of trees to protect vegetation from damage arising out of construction operations, including cutting, breaking or skinning of roots and skinning or bruising of bark. Protect tree root systems from damage, flooding, and erosion.
   1. Do not stockpile construction materials or excavated materials inside dripline.
2. University will identify historically recorded trees and vegetation not to be disturbed.

3. Water trees and other vegetation to remain as required to maintain their health for the duration of the Project.

4. Repair or replace trees and vegetation damaged by construction operations in a manner acceptable to Architect/Engineer. Use a qualified tree surgeon to perform the work.

G. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.

H. Site Enclosure Fence: Within 10 business days of mobilization, furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates and will protect adjacent sites from damage or contamination.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.

2. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide bases for supporting posts.

3. Locate so base supports do not extend outside work area where adjacent to walkways.

4. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Furnish one set of keys to University.

I. Security: Provide security program and facilities to protect the Work, existing facilities, and University operations and to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

1. Coordinate with University Police.

2. Provide lockable entrances and lock entrances at end of each work day.

3. After review and approval by University, install temporary enclosure around partially completed areas of construction.

4. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.

J. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting wherever required to prevent accidents and losses.

K. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

L. Covered Walkway: Where regulations require or where a public roadway/walkway adjoins the Project site and materials may be hoisted across the walkway, erect
protective, covered walkway for passage of individuals through or adjacent to Project site. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.
1. Construct covered walkways using scaffold or shoring framing.
2. Provide overhead waterproof decking, protective enclosure walls, handrails, barricades, warning signs, exit signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage.
3. Paint and maintain appearance of walkway for duration of the Work in a manner acceptable to the Architect/Engineer and University.
4. Extend back wall beyond structure to complete the enclosure fence.

M. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
2. Coordinate temporary enclosures with ventilating and drying-of-the-work requirements, so as to avoid dangerous conditions and deleterious effects.
3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.

N. Temporary Partitions: Provide floor-to-floor or floor-to-ceiling dustproof partitions terminating in dustproof floor or ceiling above to limit dust and dirt migration and to separate existing active elevator hoistways and other areas occupied by University from dust, fumes and noise in compliance with Section 01 35 46 “Indoor Air Quality” and the following:
1. Construct dustproof partitions with 5/8 inch gypsum wallboard with joints taped on occupied side, and 1/2 inch fire-retardant-treated plywood on construction operations side.
2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
3. Insulate partitions to control noise transmission to occupied areas.
4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
5. Protect air-handling equipment.
6. Provide walk-off mats at each entrance through temporary partition.
7. At elevator hoistway entrances not used during construction, seal openings with plastic sheet and duct tape.

O. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
1. Fire Extinguishers: Minimum one per floor at or near useable exit.
   a. Provide additional extinguishers where convenient and effective for intended purpose.
   b. Comply with NFPA 10 to the extent applicable.
2. Strictly enforce site prohibition against smoking.
3. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
4. Develop and supervise an overall fire-prevention and protection program for personnel at Project site. Coordinate with University Project Manager to review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

5. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

6. Maintain unobstructed access to fire extinguishers, temporary fire protection facilities, stairways and other access routes for fighting fires.

7. Store combustible materials in containers in fire-safe locations.

8. Permanent Fire Protection System: Complete and make operational at earliest possible date. Instruct site personnel on use of permanent system.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Comply with requirements in Section 01 35 46 "Indoor Air Quality Procedures."

3.6 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

1. Do not permit temporary offices and similar temporary or permanent spaces to be used as living quarters or for other unintended occupancies or uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Janitorial Services: Provide daily janitorial services for temporary offices, toilets, and similar areas at the project site. Require users of other temporary facilities to maintain clean and orderly premises.

D. Operate Project-identification-sign lighting daily from dusk until 12:00 midnight.

E. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

F. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion, unless Architect/Engineer requests that it be retained for a longer period of time. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. University reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00
SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:
   1. Section 01 21 00 "Allowances" for products selected under an allowance, if applicable.
   2. Section 01 23 00 "Alternates" for products selected under an alternate, if applicable.
   3. Section 01 25 00 "Substitution Procedures" for requests for substitutions.
   4. Section 01 42 00 "References" for applicable industry standards for products specified.
   5. Section 01 77 00 "Closeout Procedures" for submittal of project warranties.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance,
physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Requests for consideration of comparable products will only be entertained during bidding.
   2. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
   3. Architect/Engineer's Action: If necessary, Architect/Engineer will request additional information or documentation for evaluation of a comparable product request. Architect/Engineer will notify Contractor of approval or rejection of proposed comparable product.
      a. Form of Approval: Written Addendum.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options. The complete compatibility between the various choices available to the Contractor is not assured by the various requirements of the Contract Documents, but must be provided by the Contractor.

B. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturers or producer's nameplates or trademarks on exposed surfaces of products which will be exposed to view in occupied spaces or on the exterior.

D. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.

E. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data.
   1. Name of product and manufacturer.
   2. Model and serial number.
   3. Capacity.
   4. Speed.
5. Ratings.
6. Power characteristics (if applicable).
7. UL label or compliance (if applicable).

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents. Such disclaimers and limitations do not relieve warranty requirements on Work that incorporates product nor do they relieve suppliers, manufacturers and subcontractors required to countersign special warranties with the Contractor.
1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to University.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for University.
B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
   1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
   2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
   3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time and Form: Comply with requirements in Section 01 77 00 "Closeout Procedures."

D. Warranty Requirements:
   1. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
   2. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
   3. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the University has benefited from use of the Work through a portion of its anticipated useful service life.
   4. University's Recourse:
      a. Written warranties made to the University are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the University can enforce such other duties, obligations, rights, or remedies.
      b. Rejection of Warranties: The University reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
      c. The University reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged, are asbestos free, and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. University reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect/Engineer will make selection.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product and provide only products previously approved during bid phase by written Addendum. The determination of equivalence is at the sole discretion of the Architect/Engineer who has no obligation to prove non-equivalence.
7. Mechanical and electrical equipment design and their space requirements are based on the first named item of the Section in which specified or that scheduled on the Drawings. If other than the first named or scheduled item listed for use is selected, modification to other elements of Work may be required. Show all such modification on shop drawings and submittals as appropriate. The cost of such modifications is solely the responsibility of the Contractor.
8. Where manufacturers are listed as acceptable for specific proprietary products but precise identification by model, series, or trade name is not specified, submit detailed product information for such products for Architect/Engineer's acceptance prior to ordering. Include specific requirements for modifications to other construction, including but not limited to, power and utility requirements, characteristics, capacities, size and locations. The cost of such modifications is solely the responsibility of the Contractor.

B. Product Selection Procedures:
1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:
   a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
4. Manufacturers:
   a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the
specified or indicated product or a comparable product by one of the other named manufacturers. If proposing a comparable product by another manufacturer, whether named or not, provide a custom product if manufacturer's standard product does not include salient features of the Basis-of-Design product indicated. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

6. Contractor’s Option: Where materials, products, systems or methods are specified to be selected from a list of options, subject to compliance with requirements, the choice of which material, method, product or system will be solely at the Contractor's discretion. There will be no change in Contract Sum or Time because of such choice.

C. Visual Matching Specification: Where Specifications require "match Architect/Engineer's sample", provide a product that complies with requirements and matches Architect/Engineer's sample. Architect/Engineer's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect/Engineer from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect/Engineer will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Prior to bid, Architect/Engineer will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect/Engineer will reject request:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.

2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.

3. Evidence that proposed product provides specified warranty.

4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.

5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00
SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
   2. Field engineering and surveying.
   3. Installation of the Work.
   4. Cutting and patching.
   5. Coordination of University-installed products.
   6. Progress cleaning.
   7. Starting and adjusting.
   8. Protection of installed construction.

B. Related Requirements:
   1. Section 01 10 00 "Summary" for limits on use of Project site and procedures related to utility interruptions.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor or professional engineer.

B. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

C. Cutting and Patching Plan and Request: Submit plan and request describing procedures at least 21 calendar days prior to the time cutting and patching will be performed.
   1. Submit request whenever cutting and patching operation affect:
      a. Work of the University or any separate contractor.
b. Structural value or integrity of any element of the Project.
c. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
d. Efficiency, operational life, maintenance or safety of operational elements.
e. Visual qualities of sight-exposed elements.
f. Cutting new openings in existing structural concrete walls, floors and suspended slabs.
g. Cutting new openings in existing roofs and roofing materials.
h. Cutting exterior walls.
i. Cutting into shafts.

2. Include the following information:
   a. Extent: Describe reason for and extent of each occurrence of cutting and patching, including explanation of why cutting and patching operation cannot be reasonable avoided.
   b. Changes to In-Place Construction: Describe cutting and patching methods and anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
   c. Products: List products to be used for patching and firms or entities that will perform patching work.
   d. Trades: Indicate trades and subcontractors who will perform the work.
   e. Dates: Indicate when cutting and patching will be performed.
   f. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
      1) Include description of provisions for temporary services and systems during interruption of permanent services and systems.
      2) Comply with requirements of Section 01 10 00 “Summary” related to existing utility and system interruptions.
   g. Structural Elements: Where cutting and patching structural elements requires the addition of reinforcement, submit details and calculations signed and sealed by an Engineer registered in the State of Colorado. Indicate how new reinforcing will be integrated with original structure.

3. Limitations: Approval of cutting and patching request does not waive right of Architect/Engineer or University to later require complete removal and replacement of work found to be unsatisfactorily cut and patched.

D. Certified Surveys: Submit two copies signed by land surveyor or professional engineer.

E. Final Property Survey: Submit one electronic and two paper copies showing the Work performed and record survey data.
   1. Include certified statement that lines and levels of the work comply with the requirements of the Contract Documents and listing authorized or accepted deviations, cross-referenced to Change Order number, where applicable.
1.5 QUALITY ASSURANCE

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

B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
   1. Structural Elements: When cutting and patching structural elements, notify Architect/Engineer of locations and details of cutting and await directions from Architect/Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
   2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include but are not limited to the following:
      a. Primary operational systems and equipment.
      b. Fire separation assemblies.
      c. Air or smoke barriers.
      d. Fire-suppression systems.
      e. Mechanical systems piping and ducts.
      f. Control systems.
      g. Communication systems.
      h. Fire-detection and -alarm systems.
      i. Conveying systems.
      j. Electrical wiring systems.
      k. Operating systems of special construction.
   3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
      a. Water, moisture, or vapor barriers.
      b. Membranes and flashings.
      c. Exterior curtain-wall construction.
      d. Sprayed fire-resistive material.
      e. Equipment supports.
      f. Piping, ductwork, vessels, and equipment.
      g. Noise- and vibration-control elements and systems.
   4. Visual Elements: Do not cut and patch construction exposed to the exterior or exposed in occupied spaces in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect/Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
   5. Hazardous Materials: Do not proceed with cutting and patching operations until University has examined existing construction for the presence of asbestos and/or lead-based coatings. Comply with requirements in Section 01 35 00 "Special Procedures."
C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.
   1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Division 01 Section “Sustainable Design Requirements.”

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect/Engineer for the visual and functional performance of in-place materials.

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
   1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work. Notify University Project Manager and Architect/Engineer and obtain approval prior to disturbing, moving or penetrating soil.
   1. Arrange for locating buried utilities including water and sewer lines within construction limits. Obtain location information and stake all known utilities prior to commencing construction activities.
      a. Contact Utility Notification Center of Colorado (UNCC), 1-800-922-1987, and comply with UNCC guidelines.
   2. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
   3. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present, for compliance with requirements for installation tolerances and other conditions affecting performance.
   1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
   4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility or University, as appropriate, that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect/Engineer according to requirements in Section 01 31 00 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect/Engineer promptly.

B. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.
   1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
   2. Establish limits on use of Project site.
   3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify Architect/Engineer when deviations from required lines and levels exceed allowable tolerances. Record deviation which are accepted (i.e., not corrected) on record drawings in accordance with the requirements of Section 01 78 39 “Project Record Documents.”
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect/Engineer.

3.4 FIELD ENGINEERING

A. Identification: University will identify existing benchmarks, control points, and property corners.

B. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect/Engineer. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect/Engineer before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
D. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

E. Final Property Survey: Engage a land surveyor or professional engineer to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor or professional engineer, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.
2. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated to the extent they are more explicit or stringent than requirements of the Contract Documents.

C. Install products at the time and under conditions, including weather that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Isolate each part of complete installation from incompatible material as needed to prevent deterioration.

E. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

F. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

G. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

H. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
I. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned, true and level as applicable, with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
   1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect/Engineer.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

J. Attachment to Concrete:
   1. No drilled inserts or powder-actuated fasteners are permitted in pre-stressed concrete except as specifically authorized by Contractor and carried out under the direct supervision of its Superintendent.
   2. Only those devices with a maximum controlled penetration of 3/4 inch or less will be permitted. Make holes through slabs by means of sleeves placed no closer than 2 inch from tensioning cables. Core drilling will not be permitted unless unavoidable and as specified for cutting and patching in this Section.

K. Joints: Unless indicated otherwise, make joints of uniform width. Where joint locations in exposed work are required but not indicated, arrange joints for the best visual effect. Confirm arrangement with Architect/Engineer before proceeding. Fit exposed connections together to form hairline joints.

L. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Responsibility: Provide cutting and patching work, including attendant excavation and backfill required to complete the Work or to:
   1. Make components fit together properly.
   2. Uncover portions of the Work to provide for installation of ill-timed work.
   3. Remove and replace defective work or work not conforming to requirements of Contract Documents.
   4. Remove samples of installed work as specified for testing.
   5. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
C. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

D. Temporary Support: Provide temporary support of work to be cut.

E. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

F. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 10 00 "Summary."

G. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas, coordinate cutting and patching according to requirements in Section 01 10 00 "Summary."

H. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations. Employ methods which will prevent settlement or damage to other work.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

I. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements, including tolerance, specified in other Sections, where applicable.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
      a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
   a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

J. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 UNIVERSITY-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for University's construction personnel.

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

3.8 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
   2. Do not hold waste materials more than seven calendar days during normal weather or three calendar days if the temperature is expected to rise above 80 deg F.
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
      a. Use containers intended for holding waste materials of type to be stored.
B. Collection Point: Review location with University and obtain approval.

C. Site: Maintain Project site free of waste materials and debris.

D. Wind Blown Debris: Prevent spread of trash, debris, cartons, packing material, or other waste on or off Project site by wind.

E. Dust: Sprinkle dusty debris with water.

F. Packing Materials: Immediately after uncrating or unpacking materials or equipment, remove all crating, lumber, excelsior, wrapping or other like combustible materials from building to central collection facility.

G. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.
   2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

H. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

I. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

J. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

K. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."

L. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

M. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

N. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

O. Snow and Ice: Remove snow and ice from sidewalks adjacent to site and from access ways to building and construction site.

P. Streets: At frequency required by University and/or governing authority, clean adjacent and nearby streets of dirt resulting from construction operations.
3.9 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

C. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading.
2. Excessive internal or external pressures.
3. Excessively high or low temperatures.
4. Thermal shock.
5. Excessively high or low humidity.
6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
19. Electrical current.
20. High speed operation.
21. Improper lubrication.
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Misalignment.
25. Excessive weathering.
27. Improper shipping or handling.
28. Theft.
29. Vandalism.

END OF SECTION 01 73 00
SECTION 01 73 05 - UTILITY INTERRUPTION – MECHANICAL, ELECTRICAL, PLUMBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing the shutdown of mechanical, electrical, and plumbing services for proper notification of all impacted by shutdown.

B. Contractor to complete attached outage request and submit to university project manager.

C. Outage requests must be submitted in advance per the time periods identified on attached form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 COORDINATION

A. University staff will coordinate and announce internally to all impacted areas.

B. Contractor & Subcontractors requesting outages must be present at specified time identified in approved outage request to initiate the start of outage. If contractors are not present, outage may be postponed.

C. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

END OF SECTION 01 73 05
Utility Interruption/Outage Request Procedure

1. A Project Manager, Manager or Supervisor from the Department of Facilities Management will submit a completed Utility Outage Request form to the Outage Coordinator. It is preferred that these requests be submitted via email to the following individuals:

   To:          William.t2.ross@UCDenver.edu
   CC:          David.Tilton@UCDenver.edu

2. *A minimum of seven (7) working days advance notice is required for MINOR Utility Outages.* This allows for a 2 day field verification of the outage request and a 5 day notice for the affected areas and personnel.

   *A minimum of thirty (30) working days advance notice is required for MAJOR Utility Outages.* This allows for a 2 day field verification of the outage request and 28 working days prior notice for the affected areas and personnel

   *Flexible Schedule [if the request is less than 7 working days].* This allows for a 2 day filed verification of the outage request and the notification time frame may be reduced, determined by the Outage Coordinator

   When an Outage is requested without the benefit of the minimum advance notice (7 days for a minor outage – 30 days for a major outage), the Outage Coordinator reserves the right to decline the outage and the outage in question will need to be rescheduled for a later date. ANY AND ALL DISPUTES(Complaints?) WITH THE OCCUPANTS OF THE AFFECTED AREA(S) AND/OR CONTRACTOR(S) WILL BE RESOLVED BY THE REQUESTER.

3. A University of Colorado Project Manager, Manager or Supervisor may be asked to assist the Outage Coordinator in developing and implementing a Method of Procedure (MOP) by providing the following required information:

   - Specific Scope of Work (SOW)
   - Sequence of work to be performed (time line)
   - Requested dates of outage
   - Anticipated outage duration
   - Affected Areas/ Buildings or Systems (If unknown, contact the Outage Coordinator)

   *ONLY AFTER ALL THE REQUIRED INFORMATION OR REQUESTED INFORMATION HAS BEEN SUBMITTED, WILL THE REQUEST BE FORWARDED ON FOR APPROVAL.*

4. The Outage Coordinator will arrange to have notices posted in the affected area(s) and notify appropriate departments, Building Administrators and others listed on the form.
5. The Outage Coordinator will arrange for temporary services to be utilized if request by impacted personnel. It will be the responsibility of the Facilities Manage Projects team to provide all necessary temporary services as requested, if deemed necessary.

6. If needed, the Outage Coordinator will schedule a follow-up meeting after the completion of an Outage that experienced any type of process failure.

7. If the Outage is needed for tying in any “temporary service”, the request must be accompanied by a detailed and accurate schematic/ one lines of the placement of the new temporary service.

8. In order to assist with project timelines, the Outage Coordinator, or his designee, will be invited to attend Facilities Management Projects OAC meetings to gather and share information pertinent to all required Utility Outages.

9. Utility Outage scheduling is the responsibility of the University of Colorado Project Manager, Manager or Supervisor in regards with their contractors or crews. Utility Outages will be identified on the project schedule.

10. Every effort will be made to accommodate the requested schedule. In the event that a Utility Outage will have severe adverse impact on the occupant programs – which cannot be resolved through the Outage Coordinator, Principle Investigator, Building Administrator, Project Manager and/or Building Operations – the Utility Outage may be modified, postponed, or cancelled.

*NOTES:

*Minor Utility Outage*: This is an outage that impacts a small area, to include rooms and floors. Depending on impact it may need to be elevated to a “Major Utility Outage” which will be determined by the Outage Coordinator.

*Major Utility Outage*: This is an outage that severely impacts a building or facility’s performance by affecting one or more systems intrinsic to the operation of the building or facility as determined by the Outage Coordinator. This also includes the impact associated with personnel required to investigate and/or carry out procedures for the outage. Facilities Management will make the final determination in this regard.

*Flexible Schedule*: This is a process that depending on area of impact and personnel affected, maybe reduced. The 2 day field verification is still required in this process. If the area of impact is located only within the project site and no other areas will be affected, the University of Colorado Project Manager may request a reduced outage notification time frame.

Revised 1/25/23
**UTILITY INTERRUPTION REQUEST FORM**

<table>
<thead>
<tr>
<th>Utilities/ Service/ Equipment to be Shut Down</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Outage Requestor/ Phone #</td>
<td></td>
</tr>
<tr>
<td>Building/ Room/ Areas Affected</td>
<td></td>
</tr>
<tr>
<td>Start Time/ Start Date of Shut Down</td>
<td></td>
</tr>
<tr>
<td>Finish Time/ Finish Date of Shut Down</td>
<td></td>
</tr>
<tr>
<td>Contractor/ Phone #</td>
<td></td>
</tr>
<tr>
<td>Project Manager / Phone #</td>
<td></td>
</tr>
<tr>
<td>Project Manager Back-Up/ Phone #</td>
<td></td>
</tr>
<tr>
<td>Sub – Contractor Name/ Phone #</td>
<td></td>
</tr>
<tr>
<td>PRF # or Maximo WO #</td>
<td></td>
</tr>
<tr>
<td>Facilities Management Building Rep/ Phone #</td>
<td></td>
</tr>
</tbody>
</table>

**Scope of Work (SOW) and/ or Method of Procedure (MOP) to be done or accomplished during this outage:**

<p>| |</p>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
Instructions to Requester:

1. Submit this Utility Interruption Request Form to the Outage Coordinator. All items must be filled out completely. MOP/SOW should be written in a time line format, to include times and durations of each step in the process. An incomplete MOP/SOW will result in a delayed submission for approval.

2. Requests for minor outages must be submitted to the Outage Coordinator seven (7) working days prior to the scheduled outage. Requests for major outages must be submitted to the Outage Coordinator thirty (30) working days prior to the scheduled outage. Email addresses are as follows:

   To:  William.T2.Ross@ucdenver.edu
   CC:  David.Tilton@ucdenver.edu
        Jim.nelson@ucdenver.edu

3. Requester will receive a copy of the completed and signed Scheduled Utility Interruption document from the Outage Coordinator.

4. The Outage Coordinator will have notices posted in the affected area(s) and notify appropriate departments, Building Administrators, and others listed on the form.

When an Outage is requested without the benefit of the minimum advance notice (7 days for a minor outage - 30 days for a major outage), the Outage Coordinator will request that the Project Manager and Contractor still submit an adequate Method of Procedure (MOP) for the outage. The requester will be responsible for distributing notices to the occupants of any and all affected area(s). The requester will also distribute a copy of the Outage Posting and a copy of the MOP to the Contractor and/or person performing the outage. The requester will then send, via email, the names of all the people they have distributed notices to, as confirmation to the Outage Coordinator.

ANY AND ALL DISPUTES WITH THE OCCUPANTS OF THE AFFECTED AREA(S) WILL BE RESOLVED BY THE REQUESTER.

In case of an EMERGENCY, contact FACILITIES at 303-315-7777

REQUESTER: ____________________________________________

DATE: __________________________________________________

Revised 11/10/22
SECTION 01 77 00 - CLOSEOUT PROCEDURES

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Substantial Completion procedures, including Notice of Completion and Final Inspection procedures.
   2. Occupancy procedures, including Notice of Approval of Occupancy/Use and University Supplemental Notice of Occupancy and Use List.
   3. Final Acceptance procedures, including Pre-Acceptance Checklist and University Supplemental Building/Project Acceptance List.
   4. Inspections after completion.
   5. Warranties.
   6. Final cleaning.
   7. Repair of the Work.

B. Related Requirements:
   1. Section 01 32 33 "Photographic Documentation" for submitting final completion construction photographic documentation.
   2. Section 01 73 00 "Execution" for progress cleaning of Project site.
   3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
   4. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
   5. Section 01 79 00 "Demonstration and Training" for requirements for instructing University's personnel.

1.3 ACTION SUBMITTALS

A. Product Data: For cleaning agents.

B. Contractor's List of Incomplete Items: Initial submittal at Notice of Completion.

C. Certified List of Incomplete Items: Final submittal at Final Acceptance.

1.4 CLOSEOUT SUBMITTALS

A. Certificates of Release: From authorities having jurisdiction.

B. Certificate of Insurance: For continuing coverage.
C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 NOTICE OF COMPLETION AND SUBSTANTIAL COMPLETION PROCEDURES

A. Procedures and Submittals Prior to Notice of Completion: Complete and submit all of the following items prior to submitting Notice of Completion to Architect/Engineer. Include Contractor’s comprehensive list of items to be completed, corrected or not in compliance with the Drawings and Specifications.

1. Contractor’s List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor’s preliminary punch list), indicating the value of each item on the list and reasons why the Work is incomplete.

2. Building Inspection Record: Submit completed record with all required corrections noted.


4. Final Completion Schedule: Submit schedule for performing and completing all work indicated on the Contractor’ list of incomplete items.

5. Submit sustainable design documentation.

6. Submit closeout submittals specified in other Division 01 Sections, including project record documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.

7. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

8. Submit test/adjust/balance records.

B. Final Inspection: Submit Notice of Completion to Architect/Engineer. Upon receipt, Architect/Engineer and University will review and if all items on the University Supplemental Notice of Completion Checklist are complete will, within the timeframe required by the Contract, schedule and make an inspection of the Project to determine whether the Work is substantially complete.

1. Final Punch List: Based on the inspection, Architect/Engineer will prepare a final punch list of work to be completed, work not in compliance with the Drawings or Specifications, and unsatisfactory work for any reason.

2. Re-inspection: If the cumulative number of items identified on the final punch list prevents a determination that the work is substantially complete, complete those items and when complete resubmit Notice of Completion. Upon receipt of resubmittal, Architect/Engineer and University will then schedule and make a re-inspection of the Project to determine whether the Work is substantially complete.

C. Notice of Substantial Completion: When inspection of the Work indicates that the Project is substantially complete and all other Contract provisions required for
substantial completion have been satisfied, Architect/Engineer will issue a Notice of Substantial Completion (State Form SBP-07).

1.7 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor or as approved by Architect/Engineer.
   2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   3. Include the following information at the top of each page:
      a. Project name.
      b. Date.
      c. Name of Architect/Engineer.
      d. Name of Contractor.
      e. Page number.
   4. Submit list of incomplete items in the following format:
      a. MS Excel and PDF electronic file. Architect/Engineer will return annotated file.

1.8 OCCUPANCY PROCEDURES

A. Procedures and Submittals Prior to Occupancy: Complete and submit all items on both State Form SBP-01 “Notice of Approval of Occupancy/Use” and University Supplemental Notice of Occupancy and Use List.

1.9 FINAL ACCEPTANCE PROCEDURES

A. Procedures and Submittals Prior to Final Acceptance: Complete and submit all items on both State Form SBP-05 “Pre-Acceptance Checklist” and University Supplemental Building/Project Acceptance List.

B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 business days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect/Engineer will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect/Engineer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
1.10 SETTLEMENT AND FINAL PAYMENT

A. Submit and complete all of the following as a condition precedent to settlement and final payment:
   1. All guarantees and warranties.
   2. All statement to support local sales tax refunds, if any.
   3. Three (3) sets of operation and maintenance manuals.
   4. One (1) set of as-built Contract Documents showing all job changes.
   5. All demonstration and training completed in accordance with Section 01 79 00.
   6. All punch list items documented as complete.

B. Final Certificate of Payment: Submit in accordance with the requirements of Section 01 29 00 “Payment Procedures.”

1.11 INSPECTIONS AFTER COMPLETION

A. Warranty/Guarantee Inspections: During the warranty period, accompany Architect/Engineer and University Representative, and participate in inspection(s) of the Project to identify defective and deficient work at intervals and as required by the Contract.

B. List of Deficient or Defective Work: Within 10 business days of inspection, Architect/Engineer will provide Contractor with a list of items requiring correction.

C. Remedial Work: Upon receive of itemized list, immediately correct and remedy deficiencies and defects in a manner satisfactory to the Architect/Engineer and University.

1.12 SUBMITTAL OF PROJECT WARRANTIES

A. Time of Submittal: Submit written warranties to the Architect/Engineer prior to advertisement of the Notice of Contractor's Settlement. If the Notice of Acceptance designates a commencement date for warranties other than the date of Notice of Acceptance for the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.

B. Partial Occupancy: When a designated portion of the Work is completed and occupied or used by the University, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect/Engineer within fifteen (15) calendar days of completion of that designated portion of the Work.

C. Special Warranties: When a special warranty is required to be executed by the Contractor, or the Contractor and a Subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the University through the Architect/Engineer for approval prior to final execution. Refer to individual Specification Sections for specific requirements for special warranties.
D. Form of Submittal: Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
   1. Number of Copies: Two.
   2. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
   3. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
   4. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
   5. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.

E. Provide additional copies of each warranty to include in operation and maintenance manuals.

F. List of Extended Warranties: Provide a comprehensive list of all manufacturers' standard and special warranties with duration greater than one year after Notice of Acceptance. Organize list into an orderly sequence based on table of contents of the Project Manual.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
   1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.
   2. Do not use sweeping compounds on concrete floors that will leave residue affecting finish floor materials.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations immediately prior to Occupancy for entire Project or for a designated portion of Project:
   a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
   b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
   c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
   d. Remove tools, construction equipment, machinery, and surplus material from Project site.
   e. Remove snow and ice to provide safe access to building.
   f. Clean exposed exterior and interior finishes to a dirt-free condition, free of grease, dust, stains, films, fingerprints, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
   g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
   h. Sweep concrete floors broom clean in unoccupied spaces.
   i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
   j. Power scrub and power buff resilient flooring surfaces, tile and fluid-applied flooring.
   k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
   l. Remove labels that are not permanent.
   m. Wipe surfaces of mechanical and electrical equipment, elevator equipment where applicable, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
   n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
   o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
   p. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
   q. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
   r. Clean food service equipment to sanitary condition acceptable for intended food service use and approved by authority having jurisdiction.
   s. Leave Project clean and ready for occupancy.
C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
   1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
   2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
      a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
   3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
   4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

3.3 ATTACHMENTS

A. Samples of the following forms are appended to this Section for reference following End of Section 01 77 00:
   1. University of Colorado Denver | Anschutz Medical Campus Supplemental Notice of Occupancy and Use List.
   2. University of Colorado Denver | Anschutz Medical Campus Supplemental Building / Project Acceptance List.

END OF SECTION 01 77 00
Supplemental Notice of Occupancy and Use List  

Project Name & Number: 

Contractor: 

In addition to completing Notice of Approval of Occupancy / Use (SBP-01), the following items must be completed before Occupancy is approved:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date Completed</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Final and formal address posted on the building entries.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>2. A copy of the Contractor's in-progress red line &quot;as-built&quot; drawings has been given to BMO representative &amp; a 2nd copy is provided for Projects plan room. This is to include landscape drawings showing irrigation installation.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>3. Maintenance, operations and spare parts manuals on all installed equipment.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>4. Notice of Partial Substantial Completion concerning roles/ responsibilities of University and Contractor for security, maintenance, heat, utilities reviewed and accepted.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>5. Manufacturer maintenance, operations and spare parts manuals for fixtures, mechanical, electrical and plumbing.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>6. Hardware-maintenance, operations and spare parts manuals for doors &amp; locks, including roll up doors.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>7. Warranty Dates and Contact list for all Contractors and Suppliers given to BMO.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>8. Transfer utility account from Contractor to Facilities Operations.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>9. Site plan to include first floor main isolation locations and plans for each floor to include main utility shutoffs, for utilities to include water, electrical, steam, sewer, fuel supply, telecom, fiber optic and gasses, identified on a set of drawings.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>10. If Commissioning Report is completed, BMO has reviewed/ commented, including electrical, plumbing, mechanical/ HVAC.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>11. All Contractor provided equipment has new filters &amp; construction filters removed.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>12. Not Used</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>13. Elevator equipment rooms insulated and space conditioned for control system requirements.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>14. Testing Certifications provided to BMO for Elevators, Fire Systems &amp; Annunciator Systems.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>15. FSS has been provided with copy of Building Department testing and inspection report for window washing equipment.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>16. Roof walking pads to access equipment are installed.</td>
<td></td>
<td>CLOSED</td>
</tr>
<tr>
<td>17. PM to communicate to fire department via Life Safety Officer that building has transitioned to BMO. Alarms at Anschutz Medical Campus report to University Police Dispatch and at Downtown report to designated monitoring company.</td>
<td></td>
<td>CLOSED</td>
</tr>
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</tr>
<tr>
<td>18. BAS System (Siemens), Energy and Lighting, Fuel Systems, and Power Management must report remotely &amp; verify with University - Engineering.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>19. Training for BMO and FSS on installed equipment and systems is completed.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>20. Equipment keys and locks transitioned to Operations, including fire panels, electrical panels, directories and generator panels. Construction cores removed and replaced with permanent cores.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>21. Access control pathways and junction boxes for installed doors, gates, loading docks and roof access complete. <em>All wiring and hardware completed and electronic security access controls in place and tested by University Electronic Security.</em></td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>22. EH&amp;S is provided, as applicable for project, with fume hood certification, water testing certification, hazardous waste compliance certification, radiation compliance certification, BSL3 certification, and all other specialty equipment certification.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>23. PM notifies University Risk Management that project is transferring to University and notifies Contractor that it can eliminate Builders Risk Insurance.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>24. Not Used</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>25. Not Used</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>26. Elevator tools, including hand tools, computer, proprietary and operational software is received and confirm 1-year service from date of acceptance.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>27. All computers and software required in drawings and specs. are received, including for BAS, Energy and Lighting, Fuel Systems, and Power Management, and any specialty software and alarm codes for operating systems.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>28. For all areas to be transferred to University, all waste and debris removed; floor and wall surfaces clean and in good repair; ceiling surfaces clean, unmarked, in place, site, including sidewalks, cleared of debris and construction equipment; and roof is clear of all materials and debris.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>29. Water chlorination and testing complete and provided by PM to Chief Building Official and BMO via BMO Rep.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>30. Toilet accessories are in place that meet custodial contract.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>31. Trash receptacles outside the building are in place</td>
<td>CLOSED</td>
<td></td>
</tr>
</tbody>
</table>

---

University Project Manager (sign & print name) Date
University BMO Rep. (sign & print name) Date
University FSS Rep (sign & print name) Date
University Downtown Rep. (If Necessary) (sign & print name) Date

*Highlighted items are not the responsibility of Contractor but PM and BMO Rep must ensure these are completed and operational prior to occupancy and use.*
Mark N/A by item if it is not applicable to project
7.12.11
### Supplemental Building / Project Acceptance List

**9/22/11 Update (Clean)**

<table>
<thead>
<tr>
<th>Project Name &amp; Number:</th>
<th>Contractor:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

In addition to completing Pre-Acceptance Checklist (SBP-05), the following items must be completed before Final Acceptance.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date Completed</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Review State Buildings Pre-Acceptance check list &amp; Notice of Approval of Occupancy / use form with BMO rep &amp; confirm agreement with status</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>2. Establish list of post construction change orders &amp; track separately from basic project until items are complete – call it Phase 2 to avoid delay on basic project</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>3. O &amp; M Manuals given to BMO Representative and BMO Archivist (2 hard copies and 1 electronic total)</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>4. Record Documents – a hard copy of plans and specifications are provided for plan room &amp; given to BMO &amp; electronic auto cad &amp; specs are given to Archive Officer (Art Steinman) this is to include landscape drawings showing irrigation installation</td>
<td>OPEN</td>
<td></td>
</tr>
<tr>
<td>5. Final Site Walk is completed with University Grounds Supervisor. Drain barriers are removed and storm drains cleared. MS4 storm water plan, CDPHE permits, and evidence of final closeout received by Project Manager and all copied to University Engineering Division.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>6. Move-related work items complete including physical move, tours (occupants &amp; police), mall, phone &amp; electrical hook-ups for equipment &amp; furniture systems complete &amp; freezers enrolled in University freezer program.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>7. If exterior work is applicable: Landscape – Include a walk through with University Grounds for 1) new &amp; established 1-year service date; 2) existing damaged landscape is repaired; and 3) irrigation – zone control test is complete.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>8. Attic stock, matches spec. requirements, is located in secured location, and is inventoried</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>9. Electrical system one line diagram framed and mounted in electrical room</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>10. Spare fire suppression heads in cabinets and tool: cabinet in main electrical room includes one complete set of spare fuses for major equipment</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>11. Contractor keys issued by University BMO returned to University Key Shop via PM/ BMO Rep.</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>12. Interior Finishes Binder given to the University Project Manager: (Two hard copies)</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>13. Not Used</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td>14. Not Used</td>
<td>CLOSED</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Status</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>15.</td>
<td>Safety grating in pipe chases in place.</td>
<td>CLOSED</td>
</tr>
<tr>
<td>16.</td>
<td>Signs in place including monument sign, building exterior and site signage and building interior signage.</td>
<td>CLOSED</td>
</tr>
<tr>
<td>17.</td>
<td>All applicable reports, including Air Emission reports; Sewer Reports, including for process diverters, traps and collection tanks; Fuel Storage Tank and Detection reports; and Water System tests and reports provided to BMO via PM and BMO Rep.</td>
<td>CLOSED</td>
</tr>
<tr>
<td>18.</td>
<td>Not Used</td>
<td>CLOSED</td>
</tr>
<tr>
<td>19.</td>
<td>Not Used</td>
<td>CLOSED</td>
</tr>
<tr>
<td>20.</td>
<td>Not Used</td>
<td>CLOSED</td>
</tr>
<tr>
<td>21.</td>
<td>Not Used</td>
<td>CLOSED</td>
</tr>
<tr>
<td>22.</td>
<td>If commissioning is included for project, Commissioning Agent certification is received by BMO via PM and BMO Rep.</td>
<td>CLOSED</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>University Project Manager (sign &amp; print name)</th>
<th>Date</th>
<th>University BMO Rep. (sign &amp; print name)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>University FSS (sign &amp; print name)</td>
<td>Date</td>
<td>University Downtown Rep (if necessary) (sign &amp; print name)</td>
<td>Date</td>
</tr>
</tbody>
</table>

*Warranty dates are not subject to completion of these items by contract
**Highlighted items are not the responsibility of Contractor but PM and BMO Rep must ensure these are completed and operational prior to occupancy and use.*
Mark N/A by item if it is not applicable to project
7.12.11
SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
   1. Operation and maintenance documentation directory.
   2. Systems, subsystems, and equipment operation and maintenance manuals.
   3. Product maintenance manuals.
   4. Emergency manuals.
   5. Framed operating and maintenance instructions.

B. Related Requirements:
   1. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
   2. Section 01 91 13 "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMTTALS

A. Schedule: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 30 calendar days before commencing demonstration and training. Architect/Engineer will return copy with comments.
   1. Correct or revise each manual to comply with Architect/Engineer’s comments. Submit copies of each corrected manual within 15 calendar days of receipt of Architect/Engineer's comments and prior to commencing demonstration and training.

B. Format: Submit operations and maintenance manuals in the following format:
   1. Paper copies. Assemble in accordance with the requirements of this Section.
      a. Submit three final copies, one to be retained by the Architect/Engineer and two to be retained by the University.

C. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 30 calendar days before commencing demonstration and training. Architect/Engineer will return copy with comments.
1. Correct or revise each manual to comply with Architect/Engineer's comments. Submit copies of each corrected manual within 15 calendar days of receipt of Architect/Engineer's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Intent: Prepare data in form of an instructional manual for use by University personnel.

B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
   1. Title page.
   2. Table of contents.

C. Title Page: Include the following information:
   1. Subject matter included in manual.
   2. Name and address of Project.
   3. Name and address of University.
   4. Date of submittal.
   5. Name and contact information for Contractor.
   6. Name and contact information for Construction Manager.
   7. Name and contact information for Architect/Engineer.
   8. Name and contact information for Commissioning Authority.
   9. Names and contact information for major consultants to the Architect/Engineer that designed the systems contained in the manuals.
   10. Cross-reference to related systems in other operation and maintenance manuals.

D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
   1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

F. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
   1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

G. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence
and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

H. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
   1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in minimum 1 inch and maximum 2 inch thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
      a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
      b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
   2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
   3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
   5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
      a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
      b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 SYSTEMS, SUBSYSTEMS AND EQUIPMENT OPERATION AND MAINTENANCE MANUALS

A. General: Provide operation and maintenance manuals where indicated in individual Specification Section and the following:
   1. Heating, ventilating and air-conditioning equipment and systems.
   2. Plumbing equipment and systems.
   3. Special piping equipment and systems.
   4. Electrical distribution systems.
   5. Standby generator systems.
   6. Communications systems.
   7. Fire alarm and detection systems.
   8. Underground sprinkler systems.
   10. Food service equipment.
   11. Elevators.
   12. Other special construction and conveying systems.

B. Operation Content: In addition to requirements in this Section, include operation data required in individual Specification Sections.
   1. Additional Operation Content Required:
      b. Performance and design criteria if Contractor has delegated design responsibility.
c. Operating standards.
d. Operating procedures.
e. Operating logs.
f. Wiring diagrams.
g. Control diagrams.
h. Piped system diagrams.
i. Precautions against improper use.
j. License requirements including inspection and renewal dates.

2. Descriptions: Include the following:
   a. Product name and model number. Use designations for products indicated on Contract Documents.
b. Manufacturer's name.
c. Equipment identification with serial number of each component.
d. Equipment function.
e. Operating characteristics.
f. Limiting conditions.
g. Performance curves.
h. Engineering data and tests.
i. Complete nomenclature and number of replacement parts.

3. Operating Procedures: Include the following, as applicable:
   a. Startup procedures.
b. Equipment or system break-in procedures.
c. Routine and normal operating instructions.
d. Regulation and control procedures.
e. Instructions on stopping.
f. Normal shutdown instructions.
g. Seasonal and weekend operating instructions.
h. Required sequences for electric or electronic systems.
i. Special operating instructions and procedures.

4. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.


C. Maintenance Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers’ maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

1. Source Information: Provide the following information in a list for each product included in manual:
   a. Name, address, and telephone number of installer or supplier and maintenance service agent.
b. Name, address, and telephone number of local source for supply of replacement parts.
c. Name, address, and telephone number of maintenance contractor, where appropriate.
d. Cross-reference Specification Section number and title.
e. Drawing or schedule designation or identifier where applicable.

2. Manufacturers’ Maintenance Documentation: Manufacturers’ maintenance documentation including the following information for each component part or piece of equipment:
   a. Standard maintenance instructions and bulletins.
b. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
c. Identification and nomenclature of parts and components.
d. List of items recommended to be stocked as spare parts.
3. **Maintenance Procedures:** Include the following information and items that detail essential maintenance procedures:
   a. Test and inspection instructions.
   b. Troubleshooting guide.
   c. Precautions against improper maintenance.
   d. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   e. Aligning, adjusting, and checking instructions.
   f. Demonstration and training video recording, if available.

4. **Maintenance and Service Schedules:** Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
   a. **Scheduled Maintenance and Service:** Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
   b. **Maintenance and Service Record:** Include manufacturers' forms for recording maintenance.

5. **Spare Parts List and Source Information:** Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

6. **Maintenance Service Contracts:** Include copies of maintenance agreements with name and telephone number of service agent.

7. **Warranties and Bonds:** Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
   a. Include procedures to follow and required notifications for warranty claims.
   b. Include information sheet covering proper procedures in event of failure and instances which might affect validity of warranties and bonds.

### 2.3 PRODUCT MAINTENANCE MANUALS

**A. Content:** Organize manual into a separate section for each product, material, and finish. Separate into two manuals: one for exterior moisture protection products and those exposed to weather and one for interior products. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

**B. Source Information:** Provide the following information for each product included in manual:
   1. Name, address, and telephone number of installer or supplier and maintenance service agent.
   3. Drawing or schedule designation or identifier where applicable.

**C. Product Information:** Include the following, as applicable:
   1. Product name and model number.
   2. Manufacturer's name.
   3. Color, pattern, and texture.
   5. Reordering information for specially manufactured products.

**D. Maintenance Procedures:** Include manufacturer's written recommendations and the following:
   1. Inspection procedures.
   2. Types of cleaning agents to be used and methods of cleaning.
   3. List of cleaning agents and methods of cleaning detrimental to product.
   4. Schedule for routine cleaning and maintenance.
   5. Repair instructions.
E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

2.4 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
1. Fire.
2. Flood.
5. Power failure.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of University's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:
1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.5 FRAMED OPERATING AND MAINTENANCE INSTRUCTIONS

A. All mechanically and electrically operated equipment and controls shall be provided with legible and complete wiring diagrams, schematics, operating instructions, and pertinent preventative maintenance instructions in a sturdy frame with clear glass or plastic cover. Use non-fading, permanent media.

B. Locate frames in the same room or service enclosure as equipment, or in the nearest mechanical or electrical room.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 23
SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

   A. Section includes administrative and procedural requirements for project record documents, including the following:
      1. Record Drawings.
      2. Record Specifications.
      3. Record Product Data.
      4. Record Samples.
      5. Miscellaneous record submittals.

   B. Related Requirements:
      1. Section 01 73 00 "Execution" for final property survey.
      2. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
      3. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

   A. General: Submit record drawings with duplicate original transmittal letters containing:
      1. Date.
      2. Project title and number.
      3. Contractor’s name and address.
      4. Certification that each document as submitted is complete and accurate.
      5. Signature of authorized representative of the Contractor.

   B. Record Drawings: Submit copies of record Drawings as follows:
      1. Submit three paper-copy sets of marked-up record prints, two copies will be retained by the University and one copy retained by the Architect/Engineer.
      2. Submit three paper-copy sets and three digital copies on CD of electronic files for all delegated-design submittals. Two copies will be retained by the University and one copy retained by the Architect/Engineer.

   C. Record Specifications: Submit three paper copies of Project's Specifications, including addenda and contract modifications. Two copies will be retained by the University and one copy retained by the Architect/Engineer.

   D. Record Product Data: Submit three paper copies of each submittal. Two copies will be retained by the University and one copy retained by the Architect/Engineer.
1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

E. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit three paper copies of each submittal. Two copies will be retained by the University and one copy retained by the Architect/Engineer.

F. Interior Finishes Binder: Three copies. Two copies will be retained by the University and one copy retained by the Architect/Engineer.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
   a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
   b. Accurately record information in an acceptable drawing technique.
   c. Record data as soon as possible after obtaining it.
   d. Record and check the markup before enclosing concealed installations.
   e. Cross-reference record prints to corresponding archive photographic documentation.
   f. Mark using line types and symbols conforming to Contract Documents.

2. Content: Types of items requiring marking include, but are not limited to, the following:
   a. Dimensional changes to Drawings.
   b. Revisions to details shown on Drawings.
   c. Depths of foundations below first floor.
   d. Locations and depths of underground utilities referenced to permanent surface improvements.
   e. Revisions to routing of piping and conduits.
   f. Revisions to electrical circuitry.
   g. Actual equipment locations.
   h. Duct size and routing.
   i. Locations of concealed internal utilities referenced to visible and accessible features of structure.
   j. Locations of concealed valves, dampers, controls, balancing devices, junction boxes, cleanouts, and other items requiring access or maintenance.
   k. Changes made by Change Order.
   l. Changes made following Architect/Engineer's written orders.
   m. Details not on the original Contract Drawings.
n. Field records for variable and concealed conditions.
o. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark additional information important to University that was either shown schematically or omitted from original Drawings.
6. Note Change Order numbers, and similar identification, where applicable.

B. Record Delegated Design Electronic Files: For all delegated design submittals, including but not limited to landscape irrigation, fire alarm and fire sprinkler plans, prepare electronic files in full compliance with University of Colorado Denver | Anschutz Medical Campus Guidelines and Design Standards, Part 1.0, Paragraph “Drawing Production Standards.”

C. Identification: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
2. Identification: As follows:
   a. Project name.
   b. Date.
   c. Designation "PROJECT RECORD DRAWINGS."
   d. Name of Architect/Engineer.
   e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to substitutions, selection of options, and similar information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders where applicable.
4. Maintain one complete copy of all Addenda, Change Orders and other written change documents in printed form during construction.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Directory: Include record Product Data directory organized by Specification Section number and title.

C. Product List: Update and record any changes to Product List submitted in accordance with Section 01 60 00 “Product Requirements”, including any changes to brand, model, subcontractor, or installer so that final list reflects materials, equipment and systems incorporated into the Work.

2.4 RECORD SAMPLES

A. Prior to Final Acceptance, meet with University Project Manager and Architect/Engineer at site to review and identify which submitted samples maintained during the progress of the Work are to be transmitted to the University.

B. Deliver selected samples to storage area identified by University.

C. Finishes Binder: Three-ring notebook or notebooks, organized by Specification Section number, providing a listing and description of all material finishes on the Project and including a minimum 6 inch by 6 inch sample thereof to accompany the description. Accompany each material selection indicated with the following:
1. Manufacturer and product name.
2. Pattern name and number, as applicable.
3. Color name, as applicable.
4. Any additional information required to order replacement product.

2.5 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
1. Include manufacturer's certifications, field test record, copies of permits, licenses, certifications, inspection reports, releases, notices, receipts for fee payments and similar documents.

B. Directory: Include miscellaneous record submittals directory organized by Specification Section number and title.
PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project. Update at least weekly.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect/Engineer's and University's reference during normal working hours.

END OF SECTION 01 78 39
SECTION 01 78 46 - EXTRA STOCK MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes descriptions and quantities of required extra stock materials.

1.3 INFORMATIONAL SUBMITTALS

A. Schedule of Maintenance Materials: Prepare a schedule in tabular form of all extra stock materials required in individual Specification Sections including:
   1. Specification Section number and title.
   2. Description of required material
   3. Quantity of required material.

1.4 MAINTENANCE MATERIALS

A. Furnish extra materials that match and are from the same production runs as the product installed.

B. Provide in the quantities indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 MAINTENANCE MATERIAL SCHEDULE

<table>
<thead>
<tr>
<th>SECTION</th>
<th>TITLE</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 65 13</td>
<td>RESILIENT BASE AND ACCESSORIES</td>
<td>Furnish 50 linear feet of each type, color, pattern, and size of wall base installed. Furnish 2% of each type, color, pattern, and size of all other</td>
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</tr>
<tr>
<td>09 68 13</td>
<td>TILE CARPETING</td>
<td>Carpet Tile</td>
<td>100 sq. ft. of full-size units for each type indicated.</td>
</tr>
<tr>
<td>10 13 00</td>
<td>DIRECTORIES</td>
<td>Message Strips</td>
<td>Full-size, blank strips equal to 10 percent of amount installed for each size indicated, but no fewer than 20 strips.</td>
</tr>
<tr>
<td>11 12 00</td>
<td>PARKING CONTROL EQUIPMENT</td>
<td>Gate Arms</td>
<td>1 breakaway gate arms for each gate installed, complete with accessory components.</td>
</tr>
<tr>
<td>12 21 13</td>
<td>HORIZONTAL LOUVER BLINDS</td>
<td>Horizontal Louver Blinds</td>
<td>Full-size units equal to 1 percent of quantity installed for each size, color, texture, pattern, and gloss indicated, but no fewer than two units and no more than five units.</td>
</tr>
<tr>
<td>14 20 00</td>
<td>ELEVATORS</td>
<td></td>
<td>2 sets of complete parts catalogs including manufacturer’s recommended spare parts list with clear identification and illustration of each functional part, exploded parts views, identification of part numbers and assembly numbers including replaceable electrical and electronic parts and circuit boards.</td>
</tr>
<tr>
<td>21 05 00</td>
<td>FIRE SUPPRESSION</td>
<td>Sprinkler heads and Special Sprinkler Wrenches.</td>
<td>2 heads minimum of each type and temperature rating installed and special sprinkler wrenches enclosed in a steel cabinet in accordance with NFPA 13.</td>
</tr>
<tr>
<td>22 30 00</td>
<td>PLUMBING EQUIPMENT</td>
<td>Valve Key</td>
<td>1 valve key for each key operated wall hydrant, post hydrant, hose bib, or faucet installed.</td>
</tr>
<tr>
<td>23 05 13</td>
<td>MOTORS</td>
<td>Variable Frequency Drives</td>
<td>1 complete set of spare fuses for each VFD supplied.</td>
</tr>
<tr>
<td>23 30 00</td>
<td>HVAC AIR DISTRIBUTION</td>
<td>Fire Dampers</td>
<td>3 fusible links per type installed.</td>
</tr>
<tr>
<td>23 57 00</td>
<td>HEAT EXCHANGERS FOR HVAC</td>
<td>Heat Exchanger</td>
<td>1 gasket for each flanged connection for each heat exchanger installed.</td>
</tr>
<tr>
<td>23 65 00</td>
<td>COOLING TOWERS</td>
<td></td>
<td>3 spray nozzles for each tower cell provided.</td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Item</td>
<td></td>
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<tr>
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<td></td>
</tr>
<tr>
<td>1</td>
<td>1 gasket for each gasketed access</td>
<td>1 set of matched fan belts for each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and inspection opening provided.</td>
<td>belt driven fan provided.</td>
<td></td>
</tr>
<tr>
<td>23 70 00</td>
<td>CENTRAL HVAC EQUIPMENT</td>
<td>Air Handling Units</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 complete set of filters for each</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>air-handling unit installed.</td>
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<tr>
<td></td>
<td></td>
<td>1 set of belts for each unit</td>
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<tr>
<td></td>
<td></td>
<td>installed with label clearly</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>identifying to which fan the</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>belt belongs.</td>
<td></td>
</tr>
<tr>
<td>26 09 43</td>
<td>NETWORK LIGHTING CONTROLS</td>
<td>Control Devices</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 devices for each device used.</td>
<td></td>
</tr>
<tr>
<td>26 20 00</td>
<td>LOW VOLTAGE ELECTRICAL DISTRIBUTION</td>
<td>Fuses</td>
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<tr>
<td></td>
<td></td>
<td>1 set of 3 of each type and size</td>
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<td></td>
<td></td>
<td>used on the project and fuse</td>
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<td></td>
<td></td>
<td>cabinet in main electrical room</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>to hold them.</td>
<td></td>
</tr>
<tr>
<td>26 51 00</td>
<td>INTERIOR LIGHTING</td>
<td>Lamps</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Provide 5% or a maximum of 25</td>
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<tr>
<td></td>
<td></td>
<td>spares of each lamp type used on</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>the project.</td>
<td></td>
</tr>
<tr>
<td>28 31 00</td>
<td>FIRE DETECTION AND ALARM</td>
<td>Initiating and Control Devices</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provide 5 spare devices for each</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>device type used.</td>
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<tr>
<td></td>
<td></td>
<td>Notification Devices</td>
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<tr>
<td></td>
<td></td>
<td>Provide 5 spare devices for each</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>device type used.</td>
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</tr>
</tbody>
</table>

END OF SECTION 01 78 46
SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

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

1.2 SUMMARY
   A. Section includes administrative and procedural requirements for instructing University's personnel, including the following:
      1. Demonstration of operation of systems, subsystems, and equipment.
      2. Training in operation and maintenance of systems, subsystems, and equipment.

1.3 INFORMATIONAL SUBMITTALS
   A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors’ names for each training module. Include outline for each training module.
   B. Qualification Data: For instructor, demonstrating qualifications and ability to instruct on maintenance and care of system, equipment and products.
   C. Schedule of Demonstration and Training: Prepare a schedule in tabular form of all demonstration and training required in individual Specification Sections including:
      1. Specification Section number and title.
      2. Description of required demonstration and training.
   D. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 QUALITY ASSURANCE
   A. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 “Quality Requirements,” experienced in operation and maintenance procedures and training. Manufacturer’s sales staff is not acceptable.
   B. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 “Project Management and Coordination.” Review methods and procedures related to demonstration and training.
PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

B. Training Modules: For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
   a. System, subsystem, and equipment descriptions.
   b. Performance and design criteria if Contractor is delegated design responsibility.
   c. Operating standards.
   d. Regulatory requirements.
   e. Equipment function.
   f. Operating characteristics.
   g. Limiting conditions.
   h. Performance curves.

2. Documentation: Review the following items in detail:
   a. Emergency manuals.
   b. Operations manuals.
   c. Maintenance manuals.
   d. Project record documents.
   e. Identification systems.
   f. Warranties and bonds.
   g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:
   a. Instructions on meaning of warnings, trouble indications, and error messages.
   b. Instructions on stopping.
   c. Shutdown instructions for each type of emergency.
   d. Operating instructions for conditions outside of normal operating limits.
   e. Sequences for electric or electronic systems.
   f. Special operating instructions and procedures.
   g. A tour of the installation identifying the location of all system components.

4. Operations: Include the following, as applicable:
   a. Startup procedures.
   b. Equipment or system break-in procedures.
   c. Routine and normal operating instructions.
   d. Regulation and control procedures.
   e. Control sequences.
   f. Safety procedures.
   g. Instructions on stopping.
   h. Normal shutdown instructions.
   i. Operating procedures for emergencies.
   j. Operating procedures for system, subsystem, or equipment failure.
   k. Seasonal and weekend operating instructions.
l. Required sequences for electric or electronic systems.
m. Special operating instructions and procedures.
n. Sequence of operation.

5. Adjustments: Include the following:
   a. Alignments.
   b. Checking adjustments.
   c. Noise and vibration adjustments.
   d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:
   a. Diagnostic instructions.
   b. Test and inspection procedures.

7. Maintenance: Include the following:
   a. Inspection procedures.
   b. Types of cleaning agents to be used and methods of cleaning.
   c. List of cleaning agents and methods of cleaning detrimental to product.
   d. Procedures for routine cleaning
   e. Procedures for preventive maintenance.
   f. Procedures for routine maintenance.
   g. Instruction on use of special tools.

8. Repairs: Include the following:
   a. Diagnosis instructions.
   b. Repair instructions.
   c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
   d. Instructions for identifying parts and components.
   e. Review of spare parts needed for operation and maintenance.
   f. Product support/service model.
   g. Purchasing of replacement parts.

9. Instruction specific to Instrumentation and Controls, Electrical Gateway, Network Lighting Controls, or any other new technology that is integrated with another system: Include the following:

10. a. Overview and theory.

11. b. Wiring diagrams, including the one line diagram.

12. c. Creation, editing, and programming of the point database.
   a. Integration topology and platform for communication.
   b. Graphics packages and touch screens for the system.
   c. Alarms and diagnostics.
   d. Reporting functions dynamically and historically.
   e. Remote access to the system.
   f. Database back-up and maintenance.
   g. Replacement and re-programming of replacement parts.
   h. Point type and functionality for each type of point.
   i. Programming.
   j. Point/object editing.
   k. Loop tuning.
   l. Help files and other troubleshooting documentation.
   m. Instruction is given by the staff that setup the integration.

C. Operation and Maintenance Manuals: Provide appropriate Operation and Maintenance manuals in each training session so that the detail drawings and maintenance activities are outlined and discussed for each application.
PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module.

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct University's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. University will furnish Contractor with names and positions of participants.

B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
   1. Coordinate schedule for all training with University Project Manager and provide the following:
      a. Minimum 3 weeks notification.
      b. Training matrix in calendar format.
      c. Training outline for each session.
   2. Do not schedule training until equipment has been started up, commissioned, and is currently operating in its normal condition.
   3. Do not schedule overlapping training sessions.
   4. Schedule training sessions for a maximum of 4 hours per day; afternoons preferred.
   5. Provide separate training session on each system for operational/maintenance groups and user groups.
   6. Training sessions will be cancelled and rescheduled unless the following documentation is received:
      a. Instruction qualifications.
      b. Evidence that equipment has been started up, commissioned, and is currently operating in its normal condition.
      c. Operation and Maintenance manuals.

C. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

D. Travel, Room and Board: Coordinate any out-of-state training with the University Project Manager.

E. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.
### 3.3 DEMONSTRATION SCHEDULE

<table>
<thead>
<tr>
<th>SECTION</th>
<th>TITLE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 42</td>
<td>SWINGING AUTOMATIC ENTRANCES</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain automatic entrances.</td>
</tr>
<tr>
<td>10 11 00</td>
<td>VISUAL DISPLAY SURFACES</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain motor-operated, sliding visual display units.</td>
</tr>
<tr>
<td>10 22 38</td>
<td>OPERABLE PANEL PARTITIONS</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain operable panel partitions.</td>
</tr>
<tr>
<td>10 55 00</td>
<td>POSTAL SPECIALTIES</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain postal specialties.</td>
</tr>
<tr>
<td>11 12 00</td>
<td>PARKING CONTROL EQUIPMENT</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain parking control equipment.</td>
</tr>
<tr>
<td>11 13 00</td>
<td>LOADING DOCK EQUIPMENT</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain loading dock equipment.</td>
</tr>
<tr>
<td>11 14 00</td>
<td>FOOD SERVICE EQUIPMENT</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain foodservice equipment.</td>
</tr>
<tr>
<td>11 82 26</td>
<td>FACILITY WASTE COMPACTORS</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain waste compactors according to manufacturer's requirements and ANSI Z245.2.</td>
</tr>
<tr>
<td>12 21 13</td>
<td>HORIZONTAL LOUVER BLINDS</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain systems.</td>
</tr>
<tr>
<td>12 24 13</td>
<td>ROLLER WINDOW SHADES</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain motor-operated roller shades.</td>
</tr>
<tr>
<td>13 20 00</td>
<td>SPECIAL PURPOSE ROOMS</td>
<td>Engage a factory-authorized service representative to train and provide training video to University’s maintenance personnel to operate, adjust, maintain, and repair controlled environmental rooms and cold rooms.</td>
</tr>
<tr>
<td>14 21 00</td>
<td>ELECTRIC TRACTION ELEVATORS</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to operate, adjust, and maintain elevator(s).</td>
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<tr>
<td></td>
<td></td>
<td><strong>ELECTRIC TRACTION FREIGHT ELEVATORS</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>HYDRAULIC ELEVATORS</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>HYDRAULIC FREIGHT ELEVATORS</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>MOTORS</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>COMMISSIONING OF HVAC</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>INSTRUMENTATION AND CONTROLS</strong></td>
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<td></td>
<td></td>
<td><strong>FACILITY FUEL-OIL PIPING</strong></td>
</tr>
<tr>
<td>Code</td>
<td>Description</td>
<td>Instructions</td>
</tr>
<tr>
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<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>23 21 23</td>
<td>PUMPS</td>
<td>Engage a factory-authorized service representative to train a University Representative for 2 hours of instruction for each pumping system provided.</td>
</tr>
<tr>
<td>23 25 13</td>
<td>CHEMICAL WATER TREATMENT</td>
<td>Engage a factory-authorized service representative to train operating personnel for 8 hours to familiarize them with all treatment equipment and procedures. Include procedure for taking weekly water test on open-loop systems and the application and safe handling of supplied chemicals.</td>
</tr>
<tr>
<td>23 64 16</td>
<td>CENTRIFUGAL WATER CHILLERS</td>
<td>Engage a factory-authorized service representative to train the University’s representative for 4 hours including the operation of chillers, accessories and controls, procedures for startup and shutdown, troubleshooting, servicing, preventative maintenance, and review of the maintenance manuals.</td>
</tr>
<tr>
<td>23 65 00</td>
<td>COOLING TOWERS</td>
<td>Engage a factory-authorized service representative to train the University’s personnel for one, 8-hour day, for operation and maintenance of the cooling towers.</td>
</tr>
<tr>
<td>23 76 00</td>
<td>EVAPORATIVE COOLING EQUIPMENT</td>
<td>Engage the manufacturer’s representative to train the University’s personnel for four (4) hours. Include start-up and shutdown procedures, troubleshooting procedures, and servicing and preventative maintenance schedules and procedures, and the contents of the Operating and Maintenance Data.</td>
</tr>
<tr>
<td>26 00 00</td>
<td>ELECTRICAL</td>
<td>Engage a factory-authorized service representative to train the University’s Operations personnel a minimum of 8 hours for each system. Provide an additional minimum of 4 hours for any electrical gateway or networked lighting controls.</td>
</tr>
<tr>
<td>26 56 00</td>
<td>EXTERIOR LIGHTING</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain luminaire lowering devices.</td>
</tr>
<tr>
<td>28 31 00</td>
<td>FIRE DETECTION AND ALARM</td>
<td>Engage a factory-authorized service representative to train the University’s Operations personnel a minimum of 8 hours for each system.</td>
</tr>
<tr>
<td>32 84 00</td>
<td>PLANTING IRRIGATION</td>
<td>Engage a factory-authorized service representative to train University’s maintenance personnel to adjust, operate, and maintain automatic control valves and controllers.</td>
</tr>
</tbody>
</table>

END OF SECTION 01 79 00
SECTION 01 81 13 - SUSTAINABLE DESIGN REQUIREMENTS

PART 1 - GENERAL

1.1 SYSTEM REQUIREMENTS

A. Design Requirements:
   1. Comply with State of Colorado High Performance Certification Program (HPCP).
      a. LEED Certification Level: At a minimum, achieve the level required by the HPCP at the commencement of the project.
      b. Design building enclosure, building interiors and building systems, and select materials consistent with and as required for achievement of the project LEED certification goal, including both prerequisites and credits.
   2. LEED Checklist: Prepare a checklist identifying credits to be achieved and demonstrating that the design, when complete, will obtain the required LEED certification level.
   3. Pursue Measurement + Verification credit for all buildings.

B. Performance Requirements:
   1. Energy Reduction: Design building to achieve the reduction of energy by cost method based on ASHRAE 90.1 required by the HPCP.

1.2 QUALITY ASSURANCE

A. LEED Coordinator: Require Contractor to engage an experienced LEED-Accredited Professional to manage the LEED compliance program during construction.

B. LEED Action Plan: Require Contractor to prepare and submit plan identifying strategies for obtaining the following credits, as applicable:
   2. Credit MR 3: Salvaged and refurbished materials.
   4. Credit MR 5: Regional materials.
   5. Credit MR 7: Certified wood products.

C. LEED Progress Reports: Require Contractor to provide, with each Application for Payment, a progress report comparing construction and purchasing with LEED action plans.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Specify products and procedures necessary to obtain the LEED credits identified in the project LEED checklist, considering the following:
   1. Credit MR 3: Salvaged, refurbished or reused materials.
   2. Credit MR 4: Recycled content of material.
   3. Credit MR 5: Regional materials.
5. Credit IEQ 4: Low-Emitting Materials

PART 3 - EXECUTION

3.1 CONSTRUCTION WASTE MANAGEMENT

A. Credit MR 2: Develop a construction waste management program sufficient to achieve the level indicated in LEED checklist.

3.2 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT

A. Credit IEQ 3: Require Contractor to comply with requirements during construction and before occupancy to achieve these credits. Additional construction indoor-air-quality procedures are specified in Section 01 35 46 – Indoor Air Quality Procedures.

END OF SECTION 01 81 13
SECTION 02 81 00 - TRANSPORTATION/DISPOSAL OF HAZARDOUS MATERIAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section provides standards discovery, abatement, disposal, and worker protection for all hazardous materials including asbestos, lead, polychlorinated biphenyls (PCBs), mercury, radioactive materials, and mold.

B. All hazardous materials and waste must be managed and coordinated with Environmental Health and Safety (EHS) through the University Project Manager.

1.2 REFERENCES

A. Occupational Safety and Health Administration, 29 CFR 1926.1101, Asbestos.


C. Environmental Protection Agency, 40 CFR 763.120, Asbestos Worker Protection Rule.


E. Environmental Protection Agency 40 CFR 261.24, Toxicity Characteristic

F. Environmental Protection Agency, 40 CFR 262, Standards Applicable to Generators of Hazardous Waste


H. Code of Colorado Regulation Number 8 Control of Hazardous Air Pollutants, Part B Asbestos Control, 5 CCR 1001 – 10 Part B.


J. Air Quality Control Commission (AQCC) Regulations 19 – Lead-Based Paint Abatement.


1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Performance Requirements - Asbestos

1. Presence on Campus:
   a. Asbestos is present in many building in and around the campus. Typical forms of asbestos containing materials (ACM) include pipe insulation, ceiling, wall, floor and roof materials.
   b. Investigate every project where work will occur prior to soil disturbing activities to identify asbestos containing materials (ACM). The University Project Manager is responsible for coordinating and ensuring that an inspection or review of previous surveys and any required sampling be performed prior to finalizing the scope or work and associated budget.
c. Include the cost of investigations, sampling, waste transportation, disposal and associated costs in the cost of the project.

2. Excavation Notifications: Required as described below prior to beginning soil disturbing activities.
   a. Localized Limited Quantity Shallow Hand Digging – No notification required.
   b. Small Scale Localized Hand/Equipment Excavation – No notification required.
   c. Moderate Scale Localized Equipment Excavation – Notification to the University.
   d. Large Scale Equipment Excavation – Notification to the University.

3. Discovery of Asbestos:
   a. Notify contractors and the University Project Manager via project documents to stop work when asbestos is encountered or thought to be encountered. It is the responsibility of the University Project Manager to decide what type of action will follow, in consultation with the University’s EHS Department.

4. Asbestos Removal:
   a. Perform any asbestos removal (abatement), repair, encapsulation or spill clean-up in accordance with the above referenced regulatory standards.
   b. Utilize qualified and trained personnel for abatement design and removal in accordance with the above referenced regulatory standards.

5. Asbestos Containing Waste
   a. Follow the University asbestos waste disposal guidelines and Environmental Protection Agency regulations for disposal of asbestos generated at each project.

B. Performance Requirements – Lead
1. Presence on Campus:
   a. Typical forms of lead containing materials (LCM) include paint, lead shielding materials, electronic equipment, and piping (sink traps).
   b. Consult with EHS through the University Project Manager to determine when LCM investigation is required. The University Project Manager is responsible for coordinating and ensuring that an inspection or review of previous surveys and any required sampling be performed prior to finalizing the scope or work and associated budget.
   c. Include the cost of investigations, sampling, waste transportation, disposal and associated costs in the cost of the project.

2. Discovery of Lead:
   a. Suspect LCM at all painted surfaces of older campus buildings, brick, and walls and floors in rooms designated (or previously designated) for radiography.
   b. Notify contractors and the University Project Manager via project documents when lead is encountered or thought to be encountered. It is the responsibility of the University Project Manager to consult with EHS to decide what type of action will follow.

3. Lead Renovation:
   a. Perform any renovation of lead containing materials, repair, encapsulation or clean-up in accordance with the above referenced regulatory standards.
   b. Utilize qualified and trained personnel for renovation in accordance with the above referenced regulatory standards.

4. Handling of Lead Waste:
   a. Coordinate with EHS through the University Project Manager.
   b. Include all costs associated with handling of lead waste in the Project Cost.

1.4 SUBMITTALS

A. Abatement Specifications:
1. Provide a certified asbestos project manager on all asbestos abatement projects in which the amount of friable asbestos material to be abated exceeds 1000 linear feet on pipes or 3000 square feet on other surfaces.
2. The certified asbestos project manager must prepare and approve written abatement specifications.
3. Coordinate with the University EHS Department for additional requirements per project.
B. Asbestos Waste Manifests:
   1. Prepare hazardous waste manifests for all asbestos waste shipments associated with University asbestos related projects. Submit copies and originals of these manifests in sequential (numerical) order to the University.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

PART 4 - ILLUSTRATIONS

   1. Coordinate with the University Project Manager for attachments.
ASBESTOS-CONTAMINATED
SOIL MANAGEMENT

STANDARD OPERATING
PROCEDURE DOCUMENT

UNIVERSITY OF COLORADO
DENVER ANSCHUTZ MEDICAL
CAMPUS

Prepared for

University of Colorado Denver

February 26, 2010

WALSH ENVIRONMENTAL SCIENTISTS AND ENGINEERS, LLC
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(303) 443-3282

Project Number: 4299-630

TRANSPORTATION/DISPOSAL OF HAZARDOUS MATERIAL
DISTRIBUTION LIST

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1.1

Colorado Department of Public Health and Environment
Jeff Swanson

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Steve Tarasar
Tom Butts
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Attachments

Attachment #1 ACS Classification and AMC Boundary Site Drawing (and Survey Drawings) 
Attachment #2 Historical Buildings and Steam Tunnels Site Drawing 
Attachment #3 SOP Flow Chart 
Attachment #4 Soil Sampling and Analysis Plan (SAP) 
Attachment #5 Remediation Plan 
Attachment #6 CDPHE Notification Summary and Notification Forms
2 Purpose

This Standard Operating Procedure (SOP) document provides written standard operating procedures that are the minimum requirements for the proper training, handling, packaging, and disposal of asbestos-contaminated soil (ACS) during soil disturbing activities at the Anschutz Medical Campus (AMC) of the University of Colorado Denver (UCD). This SOP document provides specific procedures for the “management” of asbestos contaminated soil to remove only that asbestos contaminated soil, necessary to perform the work. Where “remediation” is intended to remove the full extent and depth of asbestos contaminated soil for a specific area, refer to the attached Soil Sampling and Analysis procedures provided as a supplement to this SOP in Attachment #4 and Remediation procedures provided as a supplement to this SOP in Attachment #5 of this document. The SOP was prepared for CDPHE review and approval to allow AMC to use this SOP for management of the discovered ACS rather than preparing a site specific soil characterization and management plan (SCMP) each time ACS is discovered at ACM. This document is intended for use by those directly involved with soil disturbing activities on the campus, and those who provide management/supervision of these soil disturbing activities.

UCD AMC is part of the University of Colorado and is a 227-acre campus devoted to biomedical education, patient care, and drug development is located in Aurora, Colorado on the site of the former Fitzsimons Army Medical Center. The campus is located on the north side of Colfax Avenue, between Peoria Street and Fitzsimons Parkway.

3 Scope

The procedures provided in this document shall apply to all personnel and all activities involved with the disturbance of soil known to contain asbestos material or soil that may reasonably be considered to contain asbestos material.

4 Primary Contacts, Roles and Responsibilities

<table>
<thead>
<tr>
<th>Organization</th>
<th>Role/Responsibility</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCD – Facilities Management</td>
<td>Project Management</td>
<td>Ken Neeper, Manager Infrastructure Development,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phone: 303.724.0249 Email: <a href="mailto:Ken.Neeper@UCDenver.edu">Ken.Neeper@UCDenver.edu</a></td>
</tr>
<tr>
<td>UCD – Environmental Health and Safety Division</td>
<td>Environmental Compliance – Health and Safety</td>
<td>Christina Aguilera Phone: 303.724.0242 Email: <a href="mailto:Christina.Aguilera@ucdenver.edu">Christina.Aguilera@ucdenver.edu</a></td>
</tr>
<tr>
<td>CDPHE HMWMD</td>
<td>Regulatory Agency</td>
<td>Jeff Swanson – Remediation and Restoration Unit – Federal Facilities Program Phone: 303.692.3416 <a href="mailto:jswanson@dphe.state.co.us">jswanson@dphe.state.co.us</a></td>
</tr>
<tr>
<td>Non-ACS Excavation Contractor</td>
<td>As needed excavation of non-ACS soil in accordance with this plan</td>
<td>To be determined as needed</td>
</tr>
<tr>
<td>ACS Excavation Contractor</td>
<td>As needed removal of ACS in accordance with this SOP</td>
<td>To be determined as needed</td>
</tr>
<tr>
<td>ACS Consultant</td>
<td>As needed ACS Consulting (soil characterization, remediation oversight, soil spotting, air monitoring)</td>
<td>To be determined as needed</td>
</tr>
</tbody>
</table>
5 Definitions and Abbreviations

5.1 Abbreviations

| ACM | Asbestos-containing materials |
| ACS | Asbestos-contaminated soil |
| AMC | Anschutz Medical Campus |
| AMS | Asbestos Air Monitoring Specialist, CDPHE Certified |
| CDPHE | Colorado Department of Public Health and Environment |
| GIS | Geographic information system |
| GPS | Geographic positioning system |
| MPH | Miles per hour |
| NESHAP | National Emissions Standards for Hazardous Air Pollutants |
| NIOSH | National Institute of Occupational Safety and Health |
| OSHA | Occupational Safety and Health Administration |
| PCM | Phase Contract Microscope |
| PLM | Polarized Light Microscopy |
| PPE | Personal Protective Equipment |
| SOP | Standard Operating Procedure |

5.2 Definitions

“Air Monitoring Specialist“ means a person who performs air monitoring referred to in this guidance and who is certified to perform air monitoring in accordance with Air Regulation No. 8, Part B.

Asbestos Soil Inspector means a person certified in accordance with Air Regulation No. 8, Part B, to perform asbestos inspection and sampling, and who has a minimum of six (6) months experience in asbestos-contaminated soil inspections.

“Asbestos Supervisor” means a person who has been certified as an asbestos Supervisor in accordance with Air Regulation No. 8, Part B.

“Asbestos Project Designer” or “Project Designer” means a person who has been certified as an asbestos Project Designer in accordance with Air Regulation No. 8, Part B.

“Adequately wet” means sufficiently mix or penetrate with liquid to completely prevent the release of particulate material and fibers into the ambient air. If visible emissions are observed coming from asbestos-contaminated soil or asbestos-containing material, then the material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet. Guidance on determining when a material is adequately wet can be found in EPA’s Asbestos NESHAP Adequately Wet Guidance, EPA 340/1-90-019 (December 1990).

"Asbestos" means the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), amosite (cummingtonite-grunerite), anthophyllite, and actinolite-tremolite.

"Asbestos-contaminated soil" means soil containing any amount of asbestos.

"Asbestos waste" means any asbestos-containing material whether it contains friable or nonfriable asbestos, that is not intended for further use. This term includes but is not limited to asbestos mill tailings, asbestos from pollution control devices, and containers that contain asbestos.

"Asbestos-containing material" means any material that contains more than one percent (1%) asbestos by weight, area or volume.

"Consultant" refers to entity contracted to perform training, inspections, and air monitoring related to soil disturbing activities in accordance with the SOP.

"Contractor" refers to entity contracted to perform soil disturbing activities in accordance with the SOP.

“Facility Component” means any component associated with a structure, installation, or building and includes buried utilities, tanks, structures or other installations.

"Friable" means that the material, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure, and includes previously nonfriable material after such previously nonfriable material becomes damaged to the extent that when dry it may be crumbled, pulverized, or reduced to powder by hand pressure.
“Leak tight” means that solids, liquids, or gases cannot escape or spill out. It also means dust tight.
“Mechanical” means operated or produced by mechanism or machine. This may include, but shall not be limited to, an excavator, backhoe, grader, tiller, auger, or hand shovel.
“Nonfriable” means material which, when dry, may not be crumbled, pulverized, or reduced to powder by hand pressure.
“Remediation” or “Remediate” means a cleanup or removal to prevent or minimize the possible current or future release of hazardous substances to prevent an unacceptable threat to present or future public health, welfare or the environment.
“Site” or “solid waste disposal site” means the location for a facility chosen based upon geologic, hydrogeologic and operational considerations. For the purpose of Section 5.5 of the Solid Waste Regulations “site” means the area or areas where soil-disturbing activities are occurring or will occur.
“Soil-disturbing activities” means excavation, grading, tilling, or any other mechanical activity used to disturb the soil.
"Visible emissions" means any emissions which are visually detectable without the aid of instruments, coming from material containing asbestos, asbestos waste, asbestos-contaminated soil, or from handling and disposal of asbestos waste, material containing asbestos or asbestos-contaminated soil.
"Work Area" means the area where soil disturbing activities are occurring. For asbestos contaminated soil disturbance, Work Area also means the regulated/controlled area boundary.

6 Disclosure due to Potential to Encounter ACS

The Anschutz Medical Campus (AMC) formerly the Fitzsimons Army Medical Center contained numerous buildings, some of which had been demolished and buried by the Army prior to property transfer to UCD. During development of the site by UCD, buried asbestos-containing materials located on building components (primarily direct buried steam lines, etc) and areas of asbestos-contaminated soil (asbestos debris in soil from prior building demolition, etc) have been discovered on the site. Based on excavation activities to date, these occurrences can be characterized as localized. Based on historical findings, the potential to encounter ACS on the AMC campus fall into one of the three following categories:

1. **Known ACS Area** - An area that is classified as having known ACS is one that has confirmed asbestos-containing material in the soil identified either from subsurface intrusive investigation, or from visual observation on the surface, in sidewalls, embankments, etc. This excavation is conducted by properly trained personnel in accordance with the provisions of this SOP.

2. **Moderate to High Potential ACS Area** – An area that is classified as having a moderate potential for encountering ACS is one based on historical review that asbestos material may be encountered in the soil where non-suspect construction debris has been observed historically, including wood, concrete, brick and metal components. An area that is classified as having a high potential for encountering ACS is one based on historical review that suspect asbestos material is likely to be encountered in the soil where suspect asbestos construction debris has been observed historically. Areas of Moderate to High Potential for encountering ACS may necessitate additional characterization using surface and subsurface visual inspection methods. For areas of Moderate to High Potential ACS, soil excavation activities shall be observed by an asbestos building inspector with 6 months asbestos in soil experience (asbestos soil inspector). For areas of Moderate to High Potential ACS “On-the-job” ACS awareness training shall be provided to workers directly involved with soil-disturbing activities.

3. **Low Potential ACS Area** – An area that is classified as having a low potential for encountering ACS is one in which historical review does not identify buildings or structures that previously existed at the site, utility corridors, other waste materials, or other indications that asbestos may exist on the site. A site classified as having a low potential for encountering ACS would not be a “reason to believe that visible asbestos may be encountered.” Sites with a low potential for encountering ACS would not necessitate additional characterization, spotting, “on-the-job” awareness training, or other special provisions. However, if construction debris or potential ACM is encountered during the course of soil disturbance, then the area would become a moderate to high potential ACS area and will be subject to awareness training, soil spotting and other provisions as described in this SOP.
Asbestos debris in soil at AMC can consist of friable asbestos debris (pipe insulation, etc), nonfriable asbestos debris (floor tile and cement asbestos sheet used on roofs, etc), or a combination of both. Asbestos debris may be limited to a few small pieces that are removed under limited quantity discovery procedures, or may be in a more extensive “debris field” that will be removed under “significant discovery procedures” as described in Sections 11 and 12 of this SOP.

Upon the discovery of any suspected construction debris material, the contractor shall immediately stop excavation activities in that area, and notify the UCD project manager so the condition can be inspected to determine if asbestos contaminated soil is present. These determinations will be made by an asbestos soil inspector which is an EPA accredited and CDPHE certified asbestos building inspector with 6 months soil inspection experience. Where asbestos contaminated soil is identified, this material shall be removed by a qualified contractor with properly trained personnel, in accordance with applicable regulations and procedures described in this SOP.

7 Regulatory Summary and Regulatory References

7.1 CDPHE Hazardous Materials Waste Management Division (HMWMD) – “Asbestos Contaminated Soils” not associated with the “Built Environment”

To address asbestos in soil, the Colorado Department of Public Health and Environment’s Hazardous Materials and Waste Management Division (HMWMD) has established specific management requirements for asbestos-contaminated soil under Section 5.5 of the Regulations Pertaining to Solid Waste Disposal Sites and Facilities (6 CCR 1007-2). Disposal of ACM, and work done in asbestos-contaminated soil (ACS), must comply with this regulation. The requirements of Section 5.5 of the Solid Waste Regulations apply to the owner or operator of any property with asbestos-contaminated soil at which soil-disturbing activities are occurring or planned for any area containing asbestos-contaminated soil. The requirements of Section 5.5 are triggered when the owner or operator has reason to believe or suspect the presence of asbestos-contaminated soil at a site, (through confirmation by analysis of observed material that is suspected of containing asbestos), or has reason to believe or suspects that visible asbestos will be encountered. An owner or operator that has no reason to know of or suspect asbestos-contaminated soil at a site does not have a duty to sample or otherwise investigate for asbestos-contaminated soil prior to commencing excavation, or other soil disturbing activities, at the site. It is important to understand that there is no language in the Solid Waste Regulations that requires an owner or operator to perform soil-disturbing activities, or to remediate asbestos-contaminated soil. The regulations include specific requirements that apply if asbestos-contaminated soil is disturbed or will be disturbed.

To supplement the regulation, CDPHE developed a guidance document intended to provide direction to contractors, consultants and property owners who are involved in soil disturbing activities in areas with known or suspected asbestos-contaminated soil, or where asbestos-contaminated soil is discovered. The guidance is meant to assist in compliance with the Solid Waste Regulations, and where applicable, Air Quality Control Commission Regulation No. 8, Part B (5 CCR 1001-10, Part B - Asbestos).

CDPHE Solid Waste Regulations identify two methods for addressing ACS, Management and Remediation.

1. **Management** is the removal of only that asbestos-contaminated soil necessary to perform the work, without the intent to remove additional soil outside the scope, even where observed. Management of soil in place is included under this activity. Under management, post removal soil sampling is recommended but not required for soil management actions.

2. **Remediation** is the planned removal of all asbestos-contaminated soil, removing soil beyond a particular scope of work to remove visible and analytical documented presence of asbestos. Under remediation, clearance soil sampling is required.

Both Management and Remediation approaches require CDPHE approval of a site specific soils work plan or a standard operating procedures (SOP) plan.
Remediation would be the appropriate action where a “No Further Action” letter is sought from CDPhE, or where a consent order has been issued by CDPhE, or when “closure” documentation is desired, as Management is the more accepted cost effective option to address soil contamination where this “No Further Action” is not required.

Remediation of asbestos-contaminated soil is not required under the Solid Waste Regulations, but may be conducted in accordance with Section 5.5.5 of the Regulations. It should also be noted that sampling of asbestos-contaminated soil is not required under Section 5.5 of the Solid Waste Regulations; however, the information that can be gained from sampling may be beneficial for many projects. In addition, when conducting remediation required by CDPhE (consent order, etc), sampling may be necessary to demonstrate that cleanup objectives have been met. Remediation will only be conducted at AMC where it is the intent to remediate and/or receive a no further action letter.

In accordance with Section 5.5.2 of the Solid Waste Regulations, the following projects are exempt from the requirements of Section 5.5 of the Solid Waste Regulations, but may be subject to other sections of the Solid Waste Regulations or other regulatory programs:

1. In situations where the soil contains solely nonfriable material containing asbestos, that has not been rendered friable, the nonfriable material can be removed from the soil and properly disposed in accordance with Section 5.2 of the Solid Waste Regulations. The surrounding soil would not be considered to be asbestos-contaminated soil, and therefore would not be subject to the requirements of Section 5.5 of the Solid Waste Regulations. The determination that a material is nonfriable must be made by an asbestos Building Inspector who has been certified in accordance with AQCC Regulation No. 8, Part B, and who has a minimum of six (6) months experience in asbestos-contaminated soil inspections (see Section 8.3 Worker Training).

2. The requirements of Section 5.5 of the Solid Waste Regulations do not apply to asbestos abatement of facility components (including pipes, ducts and boilers) conducted in accordance with AQCC Regulation No. 8, Part B. However, disposal of asbestos must still comply with Sections 5.1 through 5.4 of the Solid Waste Regulations.

3. The requirements of Section 5.5 of the Solid Waste Regulations do not apply to spill response activities that are subject to the requirements of AQCC Regulation No. 8, Part B. As above, disposal of asbestos must still comply with Sections 5.1 through 5.4 of the Solid Waste Regulations.

4. Ambient occurrences of asbestos that are not due to site-specific activities. Ambient occurrences of asbestos may include, but are not limited to, naturally occurring asbestos or the distribution of asbestos from normal wear of automotive products.

5. Projects involving excavations with a total volume of less than 1 cubic yard of soil using low-emission excavation methods such as hand held tools or light equipment.

The exemption for asbestos abatement projects conducted under AQCC Regulation No. 8, Part B, includes asbestos debris that may come into contact with soil during demolition of structures with asbestos-containing materials and materials containing trace amounts of asbestos (including trace soil in crawlspaces, loose fill vermiculite, etc) that can legally remain during demolition and be disposed of as normal demolition debris. Any asbestos debris left behind after the completion of a demolition project and associated site cleanup, would be subject to the requirements of Section 5.5 of the Solid Waste Regulations if disturbed in the future.

7.2 EPA, OSHA DOT and CDPhE Air Pollution Control Division (APCD) “Asbestos/Asbestos Contaminated Soils” associated with the “Built Environment”

The Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA) and the Colorado Department of Public Health and Environment (CDPhE) define asbestos-containing material (ACM) as any material containing greater than 1% asbestos as asbestos-containing material. EPA, OSHA and CDPhE define friable materials as those materials that can be crumbled or reduced to powder by hand pressure, whereas nonfriable materials cannot. Friable materials are more likely to be released into the air, especially during renovation and demolition of the building. Under EPA and CDPhE regulations, certain types of nonfriable materials (such as tar impregnated roofing and vinyl asbestos floor tile) may remain during normal demolition (provided these materials remain nonfriable during the demolition process) and also may be disposed of as normal demolition debris. In
addition drywall joint compound that contains greater than 1% asbestos may remain in a building for demolition and disposal as normal demolition debris provided the joint compound was not used as a surfacing material and the composite result of the drywall and joint compound reported less than 1% asbestos. Additionally, materials containing trace to 1% are not subject to EPA and CDPHE regulations and may remain in a building during demolition and may be disposed of as normal demolition debris. Under these provisions, it is common for asbestos to remain in a building for demolition and for subsequent disposal as normal demolition debris.

ACM is subject to the EPA National Emissions Standards for Hazardous Air Pollutants (NESHAPs) Regulations for Asbestos (40 CFR Part 61) which includes specific provisions for renovation and demolition projects pertaining to the “built” environment, and disposal of asbestos-containing waste material. ACM is subject to the EPA Toxic Substances Control Act (TSCA) which includes provisions for training and certification for asbestos remediation and consulting activities. The CDPHE is presently responsible for administering the EPA NESHAP and TSCA program for Colorado.

ACM is subject to OSHA Construction Industry Standard for Asbestos (29 CFR Parts 1910.1101). Materials containing 1% or less asbestos may be subject to OSHA regulations under certain classes of work activity, or if air concentrations are at or above the personal exposure limit (PEL) of 0.1 f/cc or the excursion limit of 1.0 f/cc. The OSHA asbestos standard includes provision for hazard communication, training, exposure assessment, respiratory protection, engineering controls, medical evaluations, and other provisions.

ACM is subject to Department of Transportation (DOT) regulations for packaging, labeling and transportation of asbestos under 49 CFR Part 173.

ACM is subject to applicable requirements of the CDPHE Air Pollution Control Division’s (APCD) Regulation 8. The term Abatement is defined by the CDPHE under the Air Pollution Control Division Regulation 8, and includes the removal of asbestos-containing materials covering facility components, which includes discovery wrapped steam line found below grade, transite® water pipe, or an abandoned buried boiler covered with asbestos. Removal of asbestos in soil associated with facility components would be subject to the requirements under CDPHE Air Pollution Regulation 8, including contractor licensing, worker certifications, permitting, etc.

1. Removal of asbestos-containing material on a facility component, that is located on or in soil that will be disturbed, shall be conducted (as stipulated under Section 5.5 of the Solid Waste Regulations), in accordance with work practices in AQCC Regulation No. 8, Part B, Section III.O, but is not subject to the permit requirements of AQCC Regulation No. 8, Part B, as long as the total quantity of asbestos-containing material is below the following trigger levels:
   a) 260 linear feet on pipes,
   b) 160 square feet on other surfaces, or
   c) The volume equivalent of a 55-gallon drum.

2. Removal of asbestos-containing material on a facility component with asbestos quantities above the trigger levels is subject to the notification, permit, and abatement requirements of AQCC Regulation No. 8, Part B, and is therefore outside the scope of Section 5.5 of the Solid Waste Regulations, as provided in Section 5.5.2(B) of the regulations.

3. Removal of pieces of asbestos-containing material, that are not on a facility component, and are located on or in soil that will be disturbed, shall be conducted under Section 5.5 of the Solid Waste Regulations, in accordance with work practices in AQCC Regulation No. 8 - Part B, Section III.O. The removal activities would not be subject to the permit requirements of AQCC Regulation No. 8, Part B.

Under EPA NESHAPs/CDPHE APCD regulations, the primary consideration under this SOP is adherence to CDPHE APCD Regulation 8 requirements for the discovery of asbestos-containing materials on buried facility components such as piping, boilers, etc and the proper removal in accordance with the EPA NESHAPs and CDPHE APCD regulations. Under CDPHE APCD regulations, secondary consideration under this SOP is the proper removal of all construction debris including nonfriable materials allowed to remain during demolition, asbestos-containing joint compound (where composite result reported less than 1%) and trace-1% asbestos materials. Where
ANSCHUTZ MEDICAL CENTER  
ASBESTOS CONTAMINATED SOIL MANAGEMENT  
STANDARD OPERATING PROCEDURE DOCUMENT

demolition debris is allowed to remain after demolition activities have been completed, any presence of asbestos in the soil would then be subject to the CDPHE HMWD ACS regulations. This issue is addressed in more detail in Section 13 (Special Considerations) of this SOP.

All work on asbestos-containing materials (ACM) must comply with the applicable requirements of EPA, OSHA, DOT and CDPHE APCD asbestos regulations.

7.3 References
CDPHE. 2006. *Asbestos-Contaminated Soil Regulations.* Section 5.5 of the Hazardous Materials and Waste Management Division’s Regulations Pertaining to Solid Waste Disposal Sites and Facilities
OSHA. Construction Industry Standards for Asbestos. 29 CFR 1926.1101

8 Classification of Types of Soil Disturbing Activities

The following are the classifications of soil disturbing activities under this SOP.

1. “Localized Limited Quantity Shallow Hand Digging” - This covers localized limited quantity (less than 1 cubic yard of soil) shallow hand digging from surface to 24 inches in depth, that is typical in the normal day-to-day operations of the campus, including sprinkler repair, planting shrubs and small potted plants, and installing fence posts/signs, etc.

2. “Small Scale” Localized Hand/Equipment Excavation - This covers deeper (greater than 24 inches) localized excavation generating greater than 1 cubic yard of soil, and includes hand digging or small/light equipment (backhoe, mini excavator, tree planters, min-excavators, and hole drilling augers, etc) for minor utility repair, tree planning, etc. With these types of excavations, the work is a very short (day duration), and the soil is typically deposited in the same location from which it is removed, and is not typically subject to relocation.

3. “Moderate Scale” Localized Equipment Excavation – This covers larger scale “localized” excavations that involve trenching or pothole excavation typically to install or repair buried utilities. With these types of excavations, the work is a is short to moderate duration (days to weeks), is conducted with a moderate sized “back-hoe” or excavator” and the soil is typically deposited in the same location from which it is removed, and is not typically subject to relocation. An example of this would be utility corridor trenching.

4. “Large Scale” Equipment Excavation – This covers largest scale excavations that involve mass excavation of a site, usually for building construction or other site development purposes. With these types of excavations, the work is a moderate to long duration (weeks to months), is conducted with large excavators, scrapers, front end loaders, etc, and the soil is typically subject to relocation on and off-site, with potential for additional soil import, depending on final grade requirements. An example of this would be “mass excavation” performed for construction of a new building.
9 Excavation Notifications

The following table summarized the types of notifications required prior to conducting soil disturbing activities.

<table>
<thead>
<tr>
<th>Low Potential ACS condition</th>
<th>Moderate to High Potential ACS condition</th>
<th>Known ACS condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localized Limited Quantity (less than 3 cubic yards) Shallow Hand Digging (less than 24 inches in depth for sprinkler repair, shrub/planting small potted plants, installing fence posts/signs etc)</td>
<td>No notification required</td>
<td>No notification required</td>
</tr>
<tr>
<td>Localized Small Scale Hand/Equipment Excavation more than 3 cubic yards and greater than 24 inches in depth (minor utility repair, tree planting, etc)</td>
<td>No notification required</td>
<td>Notification to UCD prior to start</td>
</tr>
<tr>
<td>Moderate Scale Localized Equipment Excavation (utility trenching)</td>
<td>Notification to UCD prior to start</td>
<td>Notification to UCD prior to start</td>
</tr>
<tr>
<td>Large Scale Equipment Excavation (mass excavation)</td>
<td>Notification to UCD prior to start</td>
<td>Notification to UCD prior to start</td>
</tr>
</tbody>
</table>

CDPHE will be notified within 24 hours of an unexpected ACS and/or ACM discovery. CDPHE will be notified at least 10-days prior to any planned soil-disturbing activity in areas of known ACS and/or ACM. The HMWMD can be notified by using the Notification Form attached to this plan, and emailed to CDPHE contact identified in Section 3 of this SOP. If ACS is encountered and an area reclassified as “known ACS condition” that CDPHE will be notified prior to start or re-start of work.

Additional notification shall be provided to UCD if construction debris is encountered in areas determined to be low potential ACS condition. Notification to UCD includes notification to UCD Facilities Planning Department contact and UCD Environmental Health and Safety Division contacts as provided in Section 3 of this SOP. The Contractor shall notify and receive approval from the UCD project manager prior to any soil being exported or imported to the project. Contractor shall coordinate any inspections, spotting, or testing requested by the UCD project manager for any exported or imported soils to the project. For emergency repair projects to utilities, etc, notification will be provided to CDPHE by the next business day.

10 Excavation Planning

Prior to performing any soil disturbance activities, those persons performing the soil disturbing activity shall check the AMC ACS Asbestos Contaminated Soils Classification Site Drawing (Attachment #1) to determine the classified ACS condition for the area where soil disturbing
activities will occur. Comply with notification, training and work procedures provisions of this document based on the classified condition for the area where excavation will occur which will be classified into one of the following three categories:

- **Low Potential ACS Condition** (areas shaded **green**)
- **Moderate to High Potential ACS Condition** (areas shaded yellow)
- **Known ACS Condition** (shaded coded **red**)

The following soil spotting activities will be utilized during all excavation activities for moderate to large scale excavation activities when moderate to high potential ACS conditions exist:

1. All surface work areas will be pre-inspected by the asbestos soil inspector prior to commencement of soil disturbance activities.
2. Excavation Area: conduct a subsurface visual inspection for asbestos material during excavation. The asbestos soil inspector will inspect all areas of the excavation as removal of soil proceeds, and will inspect the bottom of the excavation for visible ACM.
3. Stockpile and Backfill Areas: closely inspect stockpiled area as soil is dumped/piled.

Where ACS is identified and impacted by planned excavation, the characterization, removal and disposal of contaminated soil shall be conducted in accordance with the provisions of this SOP. Once the asbestos soil inspector has delineated the ACS boundaries (depth and extent through visual inspection characterization protocols as provided in Section 11 of this SOP), the Contractor may continue excavation in other non-ACS areas with continued spotting by an asbestos soil inspector.

For localized limited quantity (less than 1 cubic yard) shallow (less than 24 inches) hand digging for normal day-to-day operations, including sprinkler maintenance, installation of signs/posts, planting of small plants and shrubs, etc, these activities are exempt from this SOP since these activities typically occur in newly constructed areas with shallow digging occurring in the top fill layer placed during new construction, which has a low potential to contain asbestos debris, and less than 1 cubic yard by hand-digging is exempted under CDPHE HMWMD regulations. Notification shall be provided to UCD if construction debris is encountered under these exempted activities.

For additional planning purposes and as a reference, an historical site map is provided in Attachment #2 that shows the building and steam tunnel locations for the former Fitzsimons Army Medical Center. Attachment #3 contains a flow chart that summarizes the key components of this SOP document.

### 11 Training Requirements

#### 11.1 SOP circulation

The following entities/persons involved with soil disturbing activities shall be provided a copy of this SOP prior to performing work.

1. Those performing soil disturbing activities in areas with moderate to high potential to encounter ACS
2. Those providing awareness soil training
3. Those providing soil inspection or soil spotting activities during normal excavation activities.
4. Those performing soil disturbing activities in a known ACS condition area
5. Those providing air monitoring and inspection associated with soil disturbing activities in a known ACS condition area.
11.2 Awareness Training

For areas with moderate to high potential to encounter ACS, all those persons involved with the excavation regardless of size shall be provided on the job hazard communication awareness (awareness) training for those individuals associated with the soil disturbing activities as follows:

“On-the-job” asbestos soils awareness training as defined in Section 5.5.6 of the Solid Waste Regulations will be provided to workers directly involved in soil-disturbing activities on sites where there is known ACS or a “reason to believe” ACS may be encountered. The training will address such topics as history and background of asbestos, identifying types of asbestos, health effects, engineering controls, and actions to take when suspect asbestos materials are encountered. The training will be conducted with oversight and curriculum development by an asbestos building inspector, asbestos supervisor or project designer.

The awareness training must provide information necessary for the individuals to perform their duties in a way that ensures compliance with the requirements of Section 5.5 of the Solid Waste Regulations. The training must be conducted by an Asbestos Supervisor, Building Inspector or Project Designer, certified in accordance with AQCC Regulation No. 8, Part B, and who has a minimum of six (6) months experience in asbestos-contaminated soil management.

11.3 ACS Soil Disturbance Training

For moderate to large scale excavation activities in areas with known ACS, provide on the job hazard communication awareness training for those individuals associated with the soil disturbing activities. In addition personnel overseeing, directing, inspecting and/or handling asbestos or asbestos-contaminated soil during soil excavation activities shall have the following minimum training and certifications:

1. At least one (1) trained supervisor (competent person) shall be on site during excavation activities (current EPA Asbestos Supervisor Certification)
2. CDPHE HMWMD training required for persons performing asbestos-contaminated soil disturbing activities including on the job asbestos contaminated soil awareness training and training in accordance with OSHA standard 1926.1101 (k) (9) (vii) for those performing soil disturbing activities in an area with asbestos waste or asbestos contaminated soil (EPA Asbestos Supervisor/Worker training is recommended).
3. A current annual physical with medical release / respirator usage form and respirator fit test.

This training requirement applies to equipment operators but is not required for drivers of trucks carrying contaminated material for disposal to approved landfills. Drivers are only required to complete the awareness training.

For Small Scale excavation activities with known ACS, provide awareness training for those individuals associated with the soil disturbing activities. In addition personnel overseeing, directing, inspecting and/or handling asbestos or asbestos-contaminated soil during small scale soil excavation activities shall have the following minimum training and certifications:

1. At least one (1) trained supervisor (competent person) shall be on site during excavation activities.
2. CDPHE HMWMD training required for persons performing asbestos-contaminated soil disturbing activities including on the job asbestos contaminated soil awareness training and training in accordance with OSHA standard 1926.1101 (k) (9) (vii) for those performing soil disturbing activities in an area with asbestos waste or asbestos contaminated soil (Training Equivalent with OSHA Class III training for "small scale short duration" activities that will disturb asbestos recommended).
3. A current annual physical with medical release / respirator usage form and respirator fit test.

11.4 ACS Inspection and Air Monitoring Training

Individuals performing soil inspection and identification of asbestos in soil must have a current asbestos Building Inspector certification in accordance with AQCC Regulation No. 8, Part B, and must have a minimum of six (6)
months experience conducting asbestos-contaminated soil inspections. Individuals with this level of training and experience are referred to in this SOP as “asbestos soil inspectors”.

Individuals preparing and signing Soil Characterization and Management Plans must have a current Asbestos Project Designer certification in accordance with AQCC Regulation No. 8, Part B.

Individuals performing asbestos air monitoring associated with asbestos-contaminated soil disturbing activities must have a current Air Monitoring Specialist certification in accordance with AQCC Regulation No. 8, Part B

11.5 Additional Considerations
In addition, individuals with the potential for exposure to asbestos fibers should be trained in the proper usage of personal protective equipment and have a current annual physical with a medical release/respirator usage form in accordance with the employer’s medical surveillance program. Personal exposure air monitoring should be conducted in accordance with the employer’s exposure assessment program.
12 ACS Characterization Protocols and Trigger Levels

The following summarizes the potential conditions that may be encountered during soil disturbing activities at the AMC:

1. Localized areas of friable and/or nonfriable asbestos debris in soil that constitute “significant quantity” as provided under the “trigger level” of this plan. Triggering “major” response procedures as provided in this plan.

2. Localized areas of friable and/or nonfriable debris in soil that constitute “limited quantity” as provided under the “trigger level” portion of this plan, triggering “minor” spill response during planned excavation spotting activities.

3. Localized areas with construction debris with no asbestos debris, such as brick, metal, and PVC pipe, and non-asbestos suspect debris (confirmed by bulk sampling).

4. Localized areas where no visible construction debris, or visible suspect asbestos containing materials are present.

To provide a basis for appropriate level of assessment (limited vs. significant) and management for discovered asbestos debris, the following summarizes specific trigger levels to be used under this SOP. These trigger levels are “limited quantity discovery” and “significant quantity discovery” of visible friable and/or nonfriable asbestos debris and have corresponding assessment and response actions based on the limited or significant finding:

12.1 Limited Quantity Material Discovery Assessment and Management Protocol

Entry into Limited Quantity Assessment and Management Protocols: Where up to 3 pieces (with multiple pieces of asbestos within a few inches of each other to be treated as one piece of asbestos) of friable and/or nonfriable asbestos debris are identified within a 10-foot radius, record the locations with a GPS unit, photograph and log pertinent information such as location, description of material, type of debris, etc.

Exit from Limited Quantity Assessment and Management Protocols: Carefully wet and remove the visible debris and 3 cubic feet of soils surrounding each debris piece. All debris will be adequately wetted, and removed by appropriately trained and protected personnel. All debris and associated soil will be placed into appropriately labeled disposal bags, for proper disposal based on the material friability.

12.2 Significant Quantity Material Discovery Assessment and Management Protocol

Entry into Significant Quantity Assessment and Management Protocols: Where greater than 3 pieces (with multiple pieces of asbestos within a few inches of each other to be treated as one piece of asbestos) of friable and/or nonfriable asbestos debris are identified within a 10-foot radius, this will constitute a debris field. The asbestos soil inspector will conduct surface and subsurface visual assessment with the assistance of excavation equipment to determine the extent and depth of the asbestos debris field. All asbestos debris field corner points will be documented with a GPS unit, on a drawing and by photograph. Photograph and log pertinent information such as type of debris, quantity, etc.
Exit from Significant Quantity Assessment and Management Protocols: Removal of debris field based on a visual determination to the extent of excavation, or removal of extent of find (EOF) plus 1 foot of soil, and removal of depth of find (DOF) plus 1 foot of soil for subsurface contamination, and removal of extent of find (EOF) plus 1 foot of soil where only surface contamination is identified. Where visible friable and/or nonfriable asbestos debris is still observed at the extent of planned excavation, the area will be over excavated by 1 foot, and then covered with a geotechnical membrane and labeled/demarcated as asbestos-contaminated soil, and covered with 1 foot of clean fill. The boundary will be recorded with a GPS unit, on a drawing, and by photograph.

12.3 Visual Characterization for Significant Discovery

Site characterization (surface and subsurface visual assessment) will be conducted by using visual inspection to identify depth and extent of visible significant debris using pitholing and trenching techniques for asbestos debris. Soil sampling and analysis is not part of the characterization process under this SOP, and any collection and analysis of soil samples for asbestos content requires written authorization from UCD.

12.4 Surface Investigation

Surface investigation for areas identified as having potential asbestos-containing debris will be conducted for suspect asbestos debris. Surface investigation will include sampling suspect asbestos-containing material, or will assume material is asbestos-containing. Marker paint and flags will be used to demarcate locations of any suspect debris. Locations will be identified with a GPS device. The surface investigation will include photographing and logging pertinent information such as location, type of debris, quantity, etc.

12.5 Investigation Personal Protective Equipment

At a minimum, appropriate PPE must be worn when doing asbestos inspections or otherwise accessing an area suspected or known to contain asbestos. At a minimum, asbestos soil inspectors performing the inspection and/or personnel performing the pickup of non-friable asbestos must wear disposable booties and disposable rubber gloves, which should then be discarded as asbestos waste prior to exiting the site. At a minimum, asbestos soil inspectors performing the inspection and/or personnel performing the pickup of friable asbestos must wear a half-face air-purifying respirator with HEPA cartridge filtration, disposable protective suit, disposable booties and disposable rubber gloves. Disposable protective equipment should then be discarded as asbestos waste prior to exiting the site. Additional protective equipment shall be used as appropriate.

12.6 Demarcation of Discovery Locations and ACS Boundaries

Locating debris and other site conditions by GPS where specified in this SOP is considered the primary method for documenting these locations, but distance measurement (XYZ coordinate) descriptions may be used where a site grid is utilized or where locations are adjacent to structures or features. Grid/Structure reference points shall be documented with GPS in the event grid markers or structures are removed.

13 Limited Quantity ACS Management Procedures

Where the asbestos soil inspector visually observes up to three pieces of friable and/or nonfriable asbestos debris within a ten (10) foot radius, follow the procedures listed below.

For nonfriable asbestos material, adequately wet, using hand-removal methods only, gather and place the material and approximately 12 inches of surrounding soil in 6-mil poly bags. For friable asbestos material, adequately wet, using hand-removal methods only, gather and place material and 3 cubic feet of surrounding soil in 6-mil poly bags (double bags). Continue work with extra attention to possible additional asbestos in that vicinity. Stage waste bags
in a lined drum or roll-off container. Dispose of waste as asbestos contaminated waste in accordance with CDPHE regulations and this SCMP.

All personnel involved in the removal of Limited Quantity asbestos debris will wear at a minimum a half-face air purifying respirator with HEPA filtration, and disposable protective suit, disposable overbooties and disposable gloves. Decontamination of all tools and equipment involved in the removal of asbestos debris is required prior to leaving the work area. Disposable suits, overbooties and gloves shall be disposed of as asbestos waste.

14 Significant Quantity ACS Management Procedures where only Nonfriable Asbestos Material is Present

Where the asbestos soil inspector visually observes more than three pieces nonfriable asbestos debris within a ten (10) foot radius, follow the procedures listed below.

14.1 Soil Wetting and Stabilization

The Work Area will be adequately wetted to prevent any fugitive dust emissions that may be generated during initial setup and mobilization into the area. The Contractor shall use water hoses from a tank truck or directly from a fire hydrant or other water source. Water will be applied at low pressure so as to not generate dust or splattering. During all soil disturbing activities, wetting of soil will be sufficient to ensure soils are adequately wet (no visibly dry soil and no visible emissions) throughout the soil disturbing activities.

14.2 Dust and Emissions Control

General dust control will be achieved by use of water trucks that will regularly spread water on all access roads throughout the project site to ensure no visible dust generation by vehicle traffic during soil disturbance activities. Whenever contaminated soil and debris are being impacted, the Contractor will ensure that no emissions are generated. UCD’s representative will be on site to monitor the moisture of the soil being skimmed during removal and will ensure that it is adequately wet (and to observe for any visible emissions). An asbestos soil inspector will conduct these visual inspections.

If emissions are observed during the removal process, activities will immediately cease and work practices will be reviewed and modified by the Contractor. The Consultant will log all instances where visible dust emissions occurred and immediately notify UCD and CDPHE by phone and in writing, of all occurrences, and will obtain any direction from UCD and CDPHE.

14.3 PPE

During the actual soil disturbance activity, all persons within the designated work area shall utilize appropriate personal protective equipment, including appropriate respiratory protection with a minimum half face respirator with HEPA filtration required anytime active soil disturbance is occurring, protective full body tyvek® suit with attached hood and booties, gloves, rubber boots, and other protective wear as appropriate based on conditions (cold stress, heat stress, insects, etc).

14.4 Removal/Excavation

The Contractor will remove adequately wet soil in lifts with the lift thickness is determined by the depth of the adequately wet soil. The application of amended water to work area will be completed in accordance with all applicable regulations, variances, the work plan, and the on-site observations by the Consultant. Polyethylene sheeting will be placed over uncontaminated soils in the swing radius of the excavator or along the transport route of loading equipment to prevent cross-contamination. Care will be taken to avoid contamination of the excavating equipment. This will be accomplished by driving and keeping excavating equipment on non-contaminated soil. Equipment that comes in contact with contaminated soil, or that was within the designated work area will be decontaminated. Conduct work with appropriate phasing/sequencing that will minimize cross-contamination potential.
14.5 Wind and Work Stoppage Conditions
Soil disturbance operations will not be conducted if winds produce visible emissions of dust or create dust when moving equipment or soil.

14.6 Environmental Monitoring
During the execution of the soil removal, the AMS will collect air samples to assist in determining the adequacy of the engineering and environmental controls employed at the site. Air monitoring will be conducted during ACS significant discovery soil removal activities where only non friable material is visible. All air samples will be collected by a CDPHE certified Air Monitoring Specialist (AMS).
The air monitoring is described below.

1. **Sampling Media:** Air samples will be collected by drawing air through a 25-millimeter mixed cellulose ester filter, 0.8-micron pore size, with an open-faced, long cowl using low-flow personal sampling pumps at approximately 2 liters per minute (or flow rate to provide a sufficient LOQ/LOD). Each low-volume pump will be fitted with a computer microchip, which electronically regulates airflow and allows a fixed flow rate of air to pass over the face of the filter. The flow rate and the volume of air passed through the filter will be determined based on the National Institute for Occupational Safety and Health (NIOSH) 7400 analytical method. Each pump will be calibrated before and after the collection of each sample using a primary standard.

2. **Sample Analysis:** Sample analyses will be performed by a microscopist using a phase contrast microscope (PCM) according to the NIOSH 7400 Method. The microscopist will be a CDPHE certified Air Monitoring Specialist (AMS) and a participant in the NIOSH Proficiency Analytical Testing Program and have been deemed proficient. Analyses of transmission electron microscopy (TEM) air samples will be submitted to a National Institute for Standards and Technology National Voluntary Laboratory Accreditation Program accredited laboratory using TEM according to Asbestos Hazard Emergency Response Act protocol.

3. **The daily air monitoring sampling scheme will be as follows:**
   a. **Air samples will be strategically placed as close to work area without impeding equipment and worker activity, and will be collected continuously during excavation and loading operations and submitted the same day for PCM analysis. A total of 5 samples will be collected per shift per work area.**
   b. Of the 5 samples collected, three (3) perimeter samples will be placed to triangulate the work area, moving as necessary to follow the active “area-of-disturbance”, but remaining fixed in relation to each other. One (1) additional perimeter “floating sample” will be placed downwind from work activities, where potential fiber emissions are most likely to be detected. All perimeter samples shall be collected as close to the “point of disturbance” as possible, without subjecting the air monitoring equipment to damage from the operations. One (1) additional sample, to be considered the potential worst-case scenario “area equivalent” sample, will be collected on personnel closest to disturbance operations, such as the person operating the water hose.
   c. The results from these samples for comparison to 0.01 f/cc (and presence of asbestos for when analyzed by TEM) and should not be construed as “OSHA exposure assessment air samples”.
   d. **Performance Based Air Sampling:** Five (5) samples, including personnel and perimeter samples, will be submitted for PCM analysis. If analysis yields results with detectable fiber levels (based on fiber count) then TEM analysis will be conducted on the two (2) highest PCM samples for the first 3 days of each nonfriable excavation event. If no asbestos fibers are detected after the first 3 days of each event, then TEM analysis of the two (2) highest PCM samples will be reduced, to be conducted randomly twice per week. The AMS will determine on which two days TEM analysis will be conducted. TEM analysis will continue to be performed on any sample with PCM results exceeding 0.01 fibers/cc.

4. **PCM verbal results will be made available by the start of the next business day or as soon as practical after the start of the next business day. TEM verbal results will be made available within 24-hours of receipt of samples by the laboratory, and written results will be made available within 24 hours from the time the verbal result is received. UCD and CDPHE will be immediately notified if any sample results show any concentration of airborne fibers. If any asbestos fibers are detected by TEM, all investigative activities will be stopped and engineering controls will be evaluated by Contractor and Consultant, and will be discussed with UCD and CDPHE to determine if changes in engineering controls or additional PPE are required.**

5. **As an alternative to Environmental Air Monitoring for significant quantity nonfriable excavation, where soil sampling is performed in areas containing only visible nonfriable asbestos debris (per a soil sampling plan as agreed upon by UCD and CDPHE), and where soil sampling data demonstrates that no asbestos is present in the soil, and excavation work practices will not render the nonfriable material friable, environmental air monitoring may be reduced to PCM on workers only with the written approval of UCD and CDPHE.**
14.7 Personal Air Monitoring
Air sampling of personnel is an employer based responsibility, and as such shall be the responsibility of each employer associated with soil disturbing activities. The “area equivalent” samples collected on personnel are interpreted as “worst case area” samples and are not intended to provide OSHA exposure information, but can be used by employers for general informational purposes.

14.8 Truck/Container Staging/Lining and Waste Loading
All truck drivers will be instructed to close all windows and shut-off air delivery systems (fans on air-conditioning and heating systems) when entering the loading area. All travel and positioning of waste transport Truck/Trailers on the site should be visually verified clean soil to minimize the need for decontamination procedures. At the loading location, install a ten-mil polyethylene sheeting or thicker “lay-down pad” that will be placed on the ground under dumpsters/trucks to catch any spilled material. Spilled material will be cleaned up immediately and not allowed to dry out or accumulate. Additional poly shall be draped over trailer tires/fenders to minimize the need for decontamination after loading. After the load has been secured, and the load cover tarp is installed, the poly sheeting lay down loading pad will be properly decontaminated using wet wipe and or HEPA vacuuming methods. The loaded transportation truck may then proceed down the designated exit route.

14.9 Waste Transportation and Disposal
Containers of nonfriable asbestos waste, asbestos-contaminated soil with visible nonfriable asbestos, or ACS with no visible asbestos will be labeled, in accordance with the requirements of Section 5.2 of the Solid Waste Regulations. In accordance with the disposal requirements for nonfriable asbestos waste at least one 6-mil polyethylene liner/sheeting will be in trucks used for transport of soil that contains visible nonfriable asbestos. Polyethylene liners/sheeting should be designed and sized for the container to be used and should be folded over sides of trailers or containers to protect against contamination during loading and to facilitate decontamination. After loading, the liners/sheeting will be sealed and mechanically fastened in a manner that ensures that it remains intact and leak-tight during transportation and disposal operations. Containers of nonfriable asbestos waste, asbestos-contaminated soil with visible nonfriable asbestos, and asbestos-contaminated soil with no visible asbestos, shall be labeled noting “asbestos, danger” and the generator, and placed on top of sealed liner.

In addition, Department of Transportation (DOT) asbestos placards shall be placed on all four vertical sides of the container or vehicle being used for transport of ACS. The Contractor should direct the schedule of transportation of asbestos-contaminated soil. When loaded, each truck should be assigned a manifest to serve as the shipping document for that particular load.

Asbestos-contaminated soil shall be transported and disposed in a leak tight container in accordance with the CDPHE disposal requirements. Documentation stating that the soil originating from the site will not be used as daily cover or sold as clean fill shall accompany each load of asbestos-contaminated soil removed from the site.

Disposal of asbestos-contaminated soil will be conducted in accordance with the following requirements, in accordance with Section 5.5.7 of the Solid Waste Regulations:

1. Asbestos-contaminated soil containing only visible nonfriable asbestos, that has not been rendered friable, will be disposed of as nonfriable asbestos in accordance with Section 5.2 of the Solid Waste Regulations.
2. Asbestos-contaminated soils containing no visible asbestos will be disposed in a manner similar to nonfriable asbestos waste, as described in Section 5.2 of the Solid Waste Regulations.

14.10 Personnel Decontamination
A fully functioning 3-chamber decontamination trailer (or equivalent) will be placed outside the work zone to function as a remote shower location, with a clean room and an equipment room. All workers involved in removal/packaging ACS will be double suited while in the work area and will shed one suit prior to leaving the work area and immediately proceed to the decontamination facility. All workers will decontaminate per OSHA regulations and CDPHE Regulation No. 8. Decontamination water will be filtered using a 5 micron filter, or in accordance with local requirements if more stringent, prior to disposal to the sanitary sewer.
14.11 Equipment Decontamination

All equipment and tools that come into contact with, or are used for removal of ACS will be decontaminated (free of all visible dust and debris) using wet cleaning (fire hose for trackhoe equipment, wet rags for hand tools, etc) and HEPA vacuuming methods (interior of equipment cab, etc), prior to leaving the work zone. Equipment decontamination will be conducted within a decontamination station constructed adjacent to the work zone. The decontamination station will be constructed of 10-mil polyethylene sheeting (and other materials as necessary, such as EPDM rubber roofing, etc) in such a way as to capture all contaminated material and wastewater from the decontamination process. All waste water from the decontamination station will be filtered to a minimum of 5-microns (or in accordance with local requirements if more stringent, prior to discharge to a sanitary sewer), or may be used for wetting ACS.

14.12 Final Inspection Procedures

As the project progresses, visual inspection will be performed to ensure that all observable asbestos-containing materials have been removed from the soil surface. During removal of soil, the soil will be removed in a manner that will provide a flat, even surface (with no spoil piles) for visual inspection. The inspections will be performed for the surface area removed that day, as a preliminary inspection. Due to the wet nature of the removal and the soil, adequate drying time is required before a final visual inspection can be conducted.

The removal of soil in the debris field area will be considered complete when the visible asbestos-containing material has been removed and an asbestos soil inspector makes a final decision that all contaminated soil in the debris field has been removed to depth and extent of excavation (where remaining visible material will be covered with a membrane and labeled), or depth of find plus 1 foot of soil (DOF+1) and extent of find plus 1 foot of soil (EOF+1).

14.13 Managing ACS left in place

Where visible asbestos containing material is observed at the depth and extent of excavation, 1 additional foot of soil shall be removed, the area shall be covered with a geotech membrane, labeled as asbestos contaminated soil, and then the membrane shall be covered with 1 foot of clean fill to bring back to desired grade/level. Prior to covering with clean fill, photographs will be collected from each compass point of the boundary, and the corner points of the boundary shall be obtained using measurements for a control point or with a GPS device.

15 Significant Quantity ACS Management Procedures where Friable Asbestos Material is Present

Where the asbestos soil inspector visually observes more than three pieces friable asbestos debris within a ten (10) foot radius, follow the procedures listed below.

15.1 Site Control, Demarcation, Fencing and Wind Screening

The Work Area will be demarcated on all four sides using a movable/portable wind barrier to prevent wind dispersal of soil during excavation activities. Moveable/portable wind barriers will be placed on all four sides and immediately adjacent to the point of excavation, and will be of adequate height and configuration (size) to minimize wind soil dispersal at the point of excavation. For smaller areas or highly mobile removal activities, moveable “directional” mobile wind fencing may be used, but must be positioned upwind and adjacent to soil removal activities at all times. Where only directional wind fencing is used, asbestos barrier tape shall be installed to identify the remaining boundary of the Work Area (where wind fence is not positioned)

15.2 Protection of Adjacent Structures

When the abatement area is close to occupied structures, external critical barriers may need to be constructed. All openings in the structure, including windows, doorways, vents or other openings will be sealed with 6-mil poly.
15.3 Soil Wetting and Stabilization
The Work Area will be adequately wetted to prevent any fugitive dust emissions that may be generated during initial setup and mobilization into the area. The Contractor shall use water hoses from a tank truck or directly from a fire hydrant or other water source. Water will be applied at low pressure so as to not generate dust or splattering. During all soil disturbing activities, wetting of soil will be sufficient to ensure soils are adequately wet (no visibly dry soil and no visible emissions) throughout the soil disturbing activities.

15.4 Dust and Emissions Control
General dust control will be achieved by use of water trucks that will regularly spread water on all access roads throughout the project site to ensure no visible dust generation by vehicle traffic during soil disturbance activities.

Amended water and or stabilization agents will be applied for dust control within all disturbed ACS areas. The Contractor will maintain the dust control process throughout the course of the project during soil disturbing activities. Removal of soils and debris will be done with heavy equipment which has been adapted to have a water misting system installed on the equipment to minimize dust emissions at the point of removal. Water will be applied in a manner that does not cause run-off or splattering. In addition, a water misting system will be constructed to wet the material at the point of loading into the dumpster prior to final packaging.

Whenever contaminated soil and debris are being impacted, the Contractor will ensure that no emissions are generated. UCD’s representative will be on site to monitor the moisture of the soil being skimmed during removal and will ensure that it is adequately wet (and to observe for any visible emissions). An asbestos soil inspector will conduct these visual inspections.

Site management and inspectors will monitor the quantity of surface area disturbed at any given time; also the amount of surface not stabilized will be kept to the minimum quantity necessary for meaningful work to occur. If site conditions change so that dust suppression becomes questionable on the amount of disturbed area, a portion of that area will be stabilized and work will proceed on a reduced area.

If emissions are observed during the removal process, activities will immediately cease and work practices will be reviewed and modified by the Contractor. The Consultant will log all instances where visible dust emissions occurred and immediately notify UCD and CDPHE by phone and in writing, of all occurrences, and will obtain any direction from UCD and CDPHE.

15.5 PPE
During the actual soil disturbance activity, all persons within the designated work area shall utilize appropriate personal protective equipment, including appropriate respiratory protection with a minimum half face respirator with HEPA filtration required anytime active soil disturbance is occurring, protective full body tyvek suit with attached hood and booties, gloves, rubber boots, and other protective wear as appropriate based on conditions (cold stress, heat stress, insects, etc)

15.6 Removal/Excavation
Utilizing an excavator, mini excavator or backhoe with a bucket mounted spray bar system; the soil excavation will proceed within the designated work area. The spray bar system will consist of nozzles inside the back top edge of the bucket and two outside the bucket with nozzles spray pattern overlapping that will provide adequate wetting to eliminate fugitive dust, but avoid spatter or drift from spraying. Additional hand wetting will be used to eliminate fugitive emissions, but avoid splatter or drift from spraying.

The Contractor will remove adequately wet soil in lifts with the lift thickness is determined by the depth of the adequately wet soil. The application of amended water to work area will be completed in accordance with all applicable regulations, variances, the work plan, and the on-site observations by the Consultant. Polyethylene sheeting will be placed over uncontaminated soils in the swing radius of the excavator or along the transport route of loading equipment to prevent cross-contamination. Care will be taken to avoid contamination of the excavating equipment. This will be accomplished by driving and keeping excavating equipment on non-contaminated soil.
Equipment that comes in contact with contaminated soil, or that was within the designated work area will be decontaminated. Conduct work with appropriate phasing/sequencing that will minimize cross-contamination potential.

15.7 Wind and Work Stoppage Conditions

Soil disturbance operations will not be conducted if winds produce visible emissions of dust or create dust when moving equipment or soil. All wind speed measurements will be taken at locations in close proximity to, and representative of, the work area in which the soil is being handled.

**Shutdown conditions:** Soil removal/disturbance operations will immediately and temporarily cease when one or more of the following 4 conditions have been met:

1. Any wind gust reaching or exceeding 20 mph as determined by hand-held instruments;
2. Sustained wind speeds reaching or exceeding 12 mph averaged over a period of 10 minutes;
3. Winds are producing visible emissions or creating movement of dust or debris in or near the removal/disturbance area, or
4. Winds are impacting on the ability of engineering controls to work as designed.

During wind-related work shutdowns, other work activities not involving soil removal or disturbance (e.g., lining dumpsters) may continue.

**Resume Conditions:** Soil disturbance activities may resume after all of the following 4 conditions have been met:

1. All wind gust readings for a period of 20 minutes drop below 20 mph as determined by hand-held instruments;
2. Sustained wind speeds are below 12 mph averaged over a period of 20 minutes;
3. Winds are no longer producing visible emissions or creating movement of dust in or around the removal/disturbance area, and
4. Winds are not impacting on the ability of engineering controls to work as designed.

15.8 Environmental Monitoring

During the execution of the soil removal, the AMS will collect air samples to assist in determining the adequacy of the engineering and environmental controls employed at the site. Air monitoring will be conducted during ACS significant discovery soil removal activities where visible friable asbestos material is present. All air samples will be collected by a CDPHE certified Air Monitoring Specialist (AMS). The air monitoring is described below.

1. **Sampling Media:** Air samples will be collected by drawing air through a 25-millimeter mixed cellulose ester filter, 0.8-micron pore size, with an open-faced, long cowl using low-flow personal sampling pumps at approximately 2 liters per minute (or flow rate to provide a sufficient LOQ/LOD). Each low-volume pump will be fitted with a computer microchip, which electronically regulates airflow and allows a fixed flow rate of air to pass over the face of the filter. The flow rate and the volume of air passed through the filter will be determined based on the National Institute for Occupational Safety and Health (NIOSH) 7400 analytical method. Each pump will be calibrated before and after the collection of each sample using a primary standard.

2. **Sample Analysis:** Sample analyses will be performed by a microscopist using a phase contrast microscope (PCM) according to the NIOSH 7400 Method. The microscopist will be a CDPHE certified Air Monitoring Specialist (AMS) and a participant in the NIOSH Proficiency Analytical Testing Program and have been deemed proficient. Analyses of transmission electron microscopy (TEM) air samples will be submitted to a National Institute for Standards and Technology National Voluntary Laboratory Accreditation Program accredited laboratory using TEM according to Asbestos Hazard Emergency Response Act protocol.

3. The daily air monitoring sampling scheme will be as follows:
ANSCHUTZ MEDICAL CENTER
ASBESTOS CONTAMINATED SOIL MANAGEMENT
STANDARD OPERATING PROCEDURE DOCUMENT

a. Air samples will be strategically placed as close to work area without impeding equipment and worker activity, and will be collected continuously during excavation and loading operations and submitted the same day for PCM analysis. A total of 8 samples will be collected per shift per work area.

b. Of the 8 samples collected, four (4) samples will be arranged at the 4 points of the compass surrounding the work area with two (2) additional samples deemed as "perimeter floating samples". The perimeter floating samples will be placed in areas where emitted asbestos fibers are most likely to be detected (downwind from work activities). Two potential worst-case scenario “area equivalent” samples will be collected on at least 2 workers who are expected to have the greatest potential exposure to asbestos during abatement operations. The results from these samples are for comparison to 0.01f/cc (and presence of asbestos for when analyzed by TEM) and should not be construed as “OSHA exposure assessment air samples”.

4. Eight (8) samples, including personnel and perimeter samples, will be submitted for PCM analysis. If analysis yields results with detectable fiber levels (based on fiber count) then TEM analysis will be conducted on two (2) highest PCM samples to evaluate engineering controls. After two (2) weeks of TEM sampling, the analytical results and engineering controls will be assessed to determine if adequate controls are in place. If controls are deemed adequate by UCD and CDPHE, the number of TEM samples may be reduced as approved by UCD and CDPHE. On an ongoing project basis, any sample with PCM results exceeding 0.01 fibers/cc must be analyzed by TEM. For large areas of disturbance, additional perimeter monitoring points shall be added if the active area of soil disturbance is larger than approximately 1 acre in size. One additional monitoring point should be added for each additional 200 linear feet of perimeter (approximately 1 sample per additional ¼ acre increase in area). For active areas of soil disturbance greater than 1 acre, additional samples shall be analyzed by TEM at a minimum rate of 25% of the total number of samples collected, based on highest PCM results. However, TEM analysis is not required if PCM results are non-detect (based on fiber count).

5. PCM verbal results will be made available by the start of the next business day or as soon as practical after the start of the next business day. TEM verbal results will be made available within 24-hours of receipt of samples by the laboratory, and written results will be made available within 24 hours from the time the verbal result is received. UCD and CDPHE will be immediately notified if any sample results show any concentration of airborne fibers. If any asbestos fibers are detected by TEM, all investigative activities will be stopped and engineering controls will be evaluated by Contractor and Consultant, and will be discussed with UCD and CDPHE to determine if changes in engineering controls or additional PPE are required.

15.9 Personal Air Monitoring

Air sampling of personnel is an employer based responsibility, and as such shall be the responsibility of each employer associated with soil disturbing activities. The “area equivalent” samples collected on personnel are interpreted as “worst case area” samples and are not intended to provide OSHA exposure information, but can be used by employers for general informational purposes.

15.10 Truck/Container Staging/Lining and Waste Loading

All truck drivers will be instructed to close all windows and shut-off air delivery systems (fans on air-conditioning and heating systems) when entering the loading area. All travel and positioning of waste transport Truck/Trailers on the site should be visually verified clean soil to minimize the need for decontamination procedures. At the loading location, install a ten-mil polyethylene sheeting or thicker “lay-down pad” that will be placed on the ground under dumpsters/trucks to catch any spilled material. Spilled material will be cleaned up immediately and not allowed to dry out or accumulate. Additional poly shall be draped over trailer tires/fenders to minimize the need for decontamination after loading. After the load has been secured, and the load cover tarp is installed, the poly sheeting lay down loading pad will be properly decontaminated using wet wipe and or HEPA vacuuming methods.

The loaded transportation truck may then proceed down the designated exit route.

To accomplish proper characterization of soil (preliminary visual inspection and verification visual inspection at staging area), movement of soil to staging areas for subsequent loading, transportation and disposal is necessary. Staged soil must be stabilized when loading is not occurring. Upon removal of staged ACS placed on “non-ACS
area”, the contractor shall remove an additional 12 inches of soil to address any cross-contamination that may have occurred to the non-ACS area.

### 15.11 Waste Transportation and Disposal

Containers of friable asbestos waste, or asbestos-contaminated soil with visible friable asbestos, shall be labeled, in accordance with the requirements of Section 5.3 of the Solid Waste Regulations. In accordance with the disposal requirements for friable asbestos waste (Section 5.3.5(A) of the Solid Waste Regulations) at least two 6-mil polyethylene liners/sheeting shall be used for soil that contains visible friable asbestos. Polyethylene liners/sheeting should be designed and sized for the container to be used and should be folded over sides of trailers or containers to protect against contamination during loading and to facilitate decontamination. After loading, both liners/sheeting should be mechanically fasted and sealed separately. The liners/sheeting shall be sealed in a manner that ensures that they remain then leak-tight during transportation and disposal operations.

In addition, Department of Transportation (DOT) asbestos placards shall be placed on all four vertical sides of the container or vehicle being used for transport of ACM/ACS. The Contractor should direct the schedule of transportation of asbestos-contaminated soil. When loaded, each truck should be assigned a manifest to serve as the shipping document for that particular load.

Asbestos-contaminated soil shall be transported and disposed in a leak tight container in accordance with the CDPHE disposal requirements. Documentation stating that the soil originating from the site will not be used as daily cover or sold as clean fill shall accompany each load of asbestos-contaminated soil removed from the site.

Disposal of asbestos-contaminated soil will be conducted in accordance with the following requirements, in accordance with Section 5.5.7 of the Solid Waste Regulations:

1. Asbestos-contaminated soils containing visible friable asbestos will be disposed in a leak tight container as friable asbestos waste in accordance with the requirements of Section 5.3 of the Solid Waste Regulations.

### 15.12 Personnel Decontamination

A fully functioning 3-chamber decontamination trailer (or equivalent) will be placed outside the work zone to function as a remote shower location, with a clean room and an equipment room. All workers involved in removal/packaging of friable or significant quantities of nonfriable ACM will be double suited while in the work area and will shed one suit prior to leaving the work area and immediately proceed to the decontamination facility. All workers will decontaminate per OSHA regulations and CDPHE Regulation No. 8. Decontamination water will be filtered using a 5 micron filter, or in accordance with local requirements if more stringent, prior to disposal to the sanitary sewer.

### 15.13 Equipment Decontamination

All equipment and tools that come into contact with, or are used for removal of ACS will be decontaminated (free of all visible dust and debris) using wet cleaning (fire hose for trackhoe equipment, wet rags for hand tools, etc) and HEPA vacuuming methods (interior of equipment cab, etc), prior to leaving the work zone. Equipment decontamination will be conducted within a decontamination station constructed adjacent to the work zone. The decontamination station will be constructed of 10-mil polyethylene sheeting (and other materials as necessary, such as EPDM rubber roofing, etc) in such a way as to capture all contaminated material and wastewater from the decontamination process. All waste water from the decontamination station will be filtered to a minimum of 5-microns (or in accordance with local requirements if more stringent, prior to discharge to a sanitary sewer), or may be used for wetting ACS.

### 15.14 Final Inspection Procedures

As the project progresses, visual inspection will be performed to ensure that all observable asbestos-containing materials have been removed from the soil surface. During removal of soil, the soil will be removed in a manner that will provide a flat, even surface (with no spoil piles) for visual inspection. The inspections will be performed
for the surface area removed that day, as a preliminary inspection. Due to the wet nature of the removal and the soil, adequate drying time is required before a final visual inspection can be conducted.

The removal of soil in the debris field area will be considered complete when the visible asbestos-containing material has been removed and an asbestos soil inspector makes a final decision that all contaminated soil in the debris field has been removed to depth and extent of excavation (where remaining visible material will be covered with a membrane and labeled), or depth of find plus 1 foot of soil (DOF+1) and extent of find plus 1 foot of soil (EOF+1).

15.15 Managing ACS left in place
Where visible asbestos containing material is observed at the depth and extent of excavation, 1 additional foot of soil shall be removed, the area shall be covered with a geotech membrane, labeled as asbestos contaminated soil, and then the membrane shall be covered with 1 foot of clean fill to bring back to desired grade/level. Prior to covering with clean fill, photographs will be collected from each compass point of the boundary, and the corner points of the boundary shall be obtained using measurements for a control point or with a GPS device.

15.16 Spill Control
Where asbestos contaminated soil is spilled during loading or transport, the Contractor shall immediately ensure the spilled material is immediately collected in accordance with wetting and emission control provisions of this SCMP. For spills that occur on clean soil, remove 12 inches of soil under spill area as precautionary measure. For spills that occur on hard surfaces such as asphalt roadways or concrete parking lots, provide wet cleaning and HEPA vacuuming until all visible dust and debris have been removed.

Where water run-off occurs resulting in visible erosion and sediment transfer from asbestos contaminated soil areas to non-asbestos contaminated soil areas, remove top 12 inches of soil where the visible erosion and sediment deposition occurred.

15.17 Erosion Control
To control wind erosion of ACS, use of silt fencing or wind fencing may be used, where appropriate. Stabilize asbestos containing soil with friable debris by covering with magnesium chloride (or equivalent soil stabilizer) or 6-mil poly until removal can occur. Securely fasten poly sheeting to prevent removal by the wind.

To control water erosion, the use of silt fencing, erosion control mats, straw waddles or equivalent erosion control methods shall be used in areas where run-off is likely. Where ACS will remain, cover with geotech membrane, and then cover with 12 inches of clean fill and cover with appropriate vegetative growth or ground cover to prevent erosion.

16 Special Considerations

16.1 Emergency Buried Utility Repair Projects
Specific provisions of this SOP require some planning and response time that may not be appropriate in an emergency response situation to repair a buried utility. This section identifies the minimum requirements under this SOP for the first 24 hours of excavation and repair, to ensure that necessary repairs can be made to buried utilities promptly in an emergency situation where the utility must be repaired immediately (which may include evening and weekend work), where ACS is encountered during the emergency response, only worker protection, adequate wetting and no visible emission provisions of this SOP will apply within the first 24 hours, with remaining provisions including material characterization, soil training, air monitoring, disposal, etc to take effect after the first 24 hours of the excavation and repair. By ensuring adequate wetting and no visible emissions during emergency excavation during the first 24-hours, this will allow necessary work to continue, and will provide a window for implementing remaining provisions of this SOP including testing of suspect materials and where ACS is identified, and for implementing management actions under this SOP. Where suspect material is identified in soil that has been
excavated during the emergency repair, this soil shall not be placed back into the hole/pit until characterization can be conducted by an asbestos soil inspector.

16.2 Importing and Exporting Soil
The Contractor shall notify and receive approval from the UCD project manager prior to any soil being exported or imported to the project. Contractor shall coordinate any inspections, spotting, or testing requested by the UCD project manager for any exported or imported soils to the project.

16.3 Building Demolition Debris Removal Verification
To ensure demolition debris is removed during the demolition phase in accordance with applicable regulations, an asbestos soil inspector will conduct a site inspection during the final stage of demolition to determine if all demolition debris has been removed. As a precautionary measure, as part of the final demolition site cleaning, a layer of clean soil should be removed to ensure no construction debris remains upon completion of the demolition process as verified by inspection by an asbestos soil inspector, with the exception of non-asbestos-containing/contaminated “structural” fill such as concrete and brick as approved by UCD.

16.4 Soil Stockpiling Management Procedures
Stockpiling of asbestos contaminated soils will only occur under CDPHE and UCD approval, as removal of contaminated soil will be under a direct load approach unless otherwise approved by UCD and CDPHE. When soil movement and stockpiling is necessary, based on site logistics, stockpiled soil must be stabilized and covered when not in use, and must not be allowed to remain on site longer than 5 working days.

For excavation and stockpiling of non-asbestos contaminated soils that are subject to “soil spotting provisions” (moderate to high potential ACS), an asbestos soil inspector will be present at all areas where stockpiled soils are placed, and will be in radio communication with the asbestos soil inspector inspecting soils at the excavation point to ensure prompt and efficient response to discovery of visible ACM debris at either location.

16.5 Management Practices for Significant Discovery of only Nonfriable materials
Where only nonfriable materials are observed (no friable debris) in a significant discovery “debris field”, the following are required procedures:

1. Ensure material and soil is adequately wet and no visible emission occur during excavation and loading activities.
2. Packaging and disposal as nonfriable asbestos containing waste material.

16.6 Soil Sampling
The primary method for determining asbestos contaminated soil under this SOP and under CDPHE HMWMD regulation is visual identification of suspect material that is confirmed or presumed to be asbestos. Soil sampling is considered an optional activity and will be conducted only with UCD written authorization to conduct soil sampling on the campus. There are two primary situations where UCD may authorize soil sampling:

1. Soil sampling to provide general information about imported or exported soils as part of the management procedures under the SOP.
2. UCD written authorization to conduct soil sampling in conjunction with “Remediation” actions (as provided in Attachment #5) conducted to remove the full extent and depth of asbestos contaminated soil from a specified area. Remediation soil sampling may include “baseline” characterization for soil sampling collected prior to a remediation action, and will include collection of “clearance” (post-removal) soil sampling to verify removal of all asbestos (including trace amounts in soil as determined by PLM analysis).

Refer to Attachment #4 for surface soil sampling and analysis procedures.
16.7 Remediation
If the objective of an ACS removal activity is remediation of a specific location to remove the complete extent and depth of asbestos in soil at a specific location, including trace in soil as determined by PLM analysis, or for the purpose of obtaining a no further action determination under some other regulatory framework, such work must be in accordance with the remediation plan provided as a supplement to this SOP in Attachment #5. The remediation plan integrates the sampling and analysis plan (SAP) provided in Attachment #4 and describes soil handling and soil clearance (visual and bulk sampling) criteria. Refer to Attachment #5 for surface remediation procedures.

17 Project Reporting

Upon completion of soil disturbing activities, to aid in future management of site and any remaining ACS conditions known to exist, a close out report will be provided to the UCD to document work performed, and any ACS material known to exist that will remain for management.

The project close-out report shall include the following minimum components:

1. Property description and description of areas with asbestos-contaminated soils
2. Description of soil disturbing activities involving ACS (emission control procedures) and non-ACS conditions
   3. Description of all field operations or daily logs
   4. Containment logs (where appropriate)
5. Air Monitoring logs and analytical results associated with ACS removal actions
6. Description/results of all asbestos bulk sampling events, including sample locations descriptions and sample diagram/drawing showing sample locations
7. Analytical results associated with bulk sampling events
   8. Disposal summaries and manifests
   9. Maps showing excavation profiles
10. Documentation of asbestos left in place including drawings, photographs and GPS coordinates for corner points of known ACS.
11. Photographs showing pre-, during and post excavation/removal conditions
12. Accreditation and Certification documentation for activities covered under the Work Plan (Inspector, Air Monitoring Specialist, Supervisor, and Worker)

18 SOP Review and Revision

18.1 SOP Review
Annually, the UCD Facilities Planning Department contact and UCD Environmental Health and Safety Division contact as provided in Section 3 of this SOP shall review this SOP with an asbestos accredited/certified Project Designer with 6-month asbestos soil experience to identify any needed revisions to this SOP.

18.2 SOP Review
Based on annual review, any revisions to the SOP shall be submitted to CDPHE as a “revised” SOP with a new revision number and revision date for CDPHE review and approval.

19 Attachments

Attachment #1 ACS Classification and AMC Boundary Drawing (and Site Survey Drawings)
Attachment #2 Historical Buildings and Steam Tunnels Site Drawing
Attachment #3 SOP Flow Chart
Attachment #4 Soil Sampling and Analysis Plan (SAP)
ATTACHMENT 1

ACS CLASSIFICATION AND AMC BOUNDARY
SITE DRAWING AND SITE SURVEY DRAWINGS
ATTACHMENT #2

HISTORICAL BUILDING AND STEAM TUNNEL
SITE DRAWING
ATTACHMENT #3

SOP FLOW CHART
ATTACHMENT #4

SOP SUPPLEMENTAL PROCEDURES
SOIL SAMPLING AND ANALYSIS PLAN (SAP)

General

1. Sample aliquots should be collected using a scooping device (stainless steel spoon or equivalent), and transferred to a composite sample container.
2. When all aliquots have been collected, the composite sample container should be sealed and labeled with a sample number unique to the boring from which the sample was collected. The sample should be homogenized by the laboratory prior to analysis.
3. A field sampling form or log book entry should be maintained for each sample. The form or log book entry should contain the location, date and time of each sample, a description of the type of and friability of any suspect material encountered, and any observations made during sample collection.
4. Proper chain-of-custody protocols should be followed for all samples collected.

Analytical Procedures

1. Soil samples should be analyzed by PLM for bulk asbestos samples (Method – EPA/600/R-93/116). The samples should be homogenized by the laboratory prior to sample analysis.

Surface Soil Sampling

1. Divide the area to be inspected into a grid, using stakes or paint to mark grid nodes. The area of each grid square will be determined based on the size of the site, and existing knowledge of the extent and concentration of surface asbestos;
2. Grids are (50’ x 50’) on an X and Y axis utilizing planned north with the south west corner of each grid being the reference point for each grid site wide. X axis designation is numerical and Y axis grid designation is alphabetical.
3. Each grid point is identified in the lower left (Southwest) corner with a 48” wood lathe with pink ribbon alpha numerically (i.e. B15, CA12).
4. Sub-grids (25’ x 50’) rectangle grids within each (50’ x 50’) grid are identified with pin flags alpha numerically (i.e. B15-1, CA12-2).
5. Where grids extend beyond a scope of work boundary and/or property boundary, this boundary will be designated with a string line to delineate scope in partial grids (where grids overlay on scope of work or property boundary).
6. Using flags, paint or GPS, mark locations of any suspected asbestos found;
7. Record locations of suspected asbestos found using a map, log or other documentation. The absence of asbestos in a grid square will also be documented;
8. Place suspected asbestos material in a sample bag, adequately wetting it prior to disturbing it; and record time and date, location and description of material collected.
9. A composite aliquot soil sample will be collected within each sub-grid 1,250 square feet (25’ x 50’) by an asbestos soil inspector. The asbestos soil inspector will collect ten aliquots of surface soil (top 1 inch) within each sub-grid. Two sample aliquots will be collected from the southwest quadrant, southeast quadrant, northwest quadrant, northeast quadrant, and the relative center of the sub-grid (totaling ten aliquots per sub-grid). A grid will be considered an asbestos contaminated soil grid where soil sampling data reports the presence of asbestos in any sub grid within that grid (thus progressive analysis may be used to create sample sets for each grid, with a positive stop used where analysis shows asbestos present (eliminating the need to analyze the second sub grid).
10. Samples will be placed in a sample jar, labeled, and location, time, date will be documented.
11. The sample will be homogenized at the laboratory;
12. Follow proper chain of custody protocols.
Subsurface Soil Sampling - Borings

1. A composite sample should be collected from each soil boring. The sample should be made up of five (5) to ten (10) aliquots representative of the soil boring. The actual number of aliquots may vary depending on the depth of sampling and the conditions observed.

Subsurface Soil Sampling – Potholes and Trenches

1. Collect a composite sample made up of five (5) to ten (10) aliquots representative of the soil encountered in the trench or pothole. The actual number of aliquots may vary depending on the depth of sampling and the conditions observed. In addition, it may be warranted to collect separate samples from various strata, with aliquots collected from individual strata, to better characterize observed conditions.

Informational Soil Samples for Imported/Exported Soil

1. The asbestos soil inspector will collect composite samples comprised of 10-point aliquots from 10% of the total number of loads dumped (for imported soils) and/or loaded (for exported soils). Soils sampled for informational purposes shall be managed in an appropriate manner (stockpiled by day, area, etc) to allow appropriate management of soil based on soil sampling data. All soil samples will be submitted to an accredited laboratory for PLM analysis on a “rush” turnaround.

Interpretation of Sampling Data

1. Samples reporting no asbestos detected shall be interpreted as non-ACS, and samples reporting the presence of asbestos shall be considered ACS.
ATTACHMENT #5

SOP SUPPLEMENTAL PROCEDURES
REMEDIATION PLAN

Where the intent is to remediate (removal all visible debris and asbestos in soil to a concentration of no asbestos detected in the soil, based on soil sampling), the following supplement to the SOP provides specific remediation provisions.

The following provisions identified in Section 12 of the SOP shall apply to ACS surface soil remediation (soil removal, packaging, transportation and disposal) procedures:

- Notifications Planned Asbestos-contaminated Soil Disturbance
  - Limited Quantity Discovery Management and Disposal
  - Site Control, Demarcation, Fencing and Wind Screening
    - Protection of Adjacent Structures
    - Soil Wetting and Stabilization
    - Dust and Emissions Control
      - PPE
  - Equipment/Engineering Controls
    - Removal/Excavation
    - Soil Stockpiling
  - Wind and Work Stoppage Conditions
    - Environmental Monitoring
    - Personal Air Monitoring
  - Truck/Container Staging/Lining and Waste Loading
    - Waste Transportation and Disposal
    - Personnel Decontamination
    - Equipment Decontamination
    - Final Inspection Procedures

All ACS identified based on visual characterization (extent and depth) of find, shall be removed plus an additional 12 inches of soil beyond the extent of find (EOF) and 12 additional inches beyond the depth of find (DOF) which identifies the 3-dimension box of soil removed under the remediation.

After removal to EOF and DOF based on visual and preliminary soil sampling data, post remediation “surface clearance” soil sampling will be conducted in accordance with the Soil Sampling and Analysis Plan (Attachment #4) of this SOP, on a grid by grid basis. Any grid reporting the presence of asbestos will be considered to have “failed” and will require removal of additional twelve (12) inches of soil, and the “clearance process will be repeated until “no asbestos detected” is reported for that grid, after which that grid will then have deemed to “pass”. Once all grids in the delineated area have been characterized, remediated, and passed “clearance soil testing”, the remediation action will be considered complete.
ATTACHMENT #6

CDPHE HMWMD NOTIFICATION SUMMARY AND NOTIFICATION FORMS
April 28, 2010

Mr. Ken Neepher
Manager Infrastructure Development
University of Colorado Denver
Mail Stop F418
1945 North Wheeling Street
Aurora, CO 80045

RE: Asbestos-Contaminated Soil (ASC) Management, Standard Operating Procedure (SOP) Document,
University of Colorado Denver Anschutz Medical Campus, February 26, 2010

Dear Mr. Neepher,

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division (the “Division”), has received and reviewed the above referenced standard operating procedures for the proper management of asbestos-contaminated soils during soil disturbing activities at the Anschutz Medical Campus of the University of Colorado Denver. The Anschutz Medical Campus is located on the site of the former Fitzsimons Army medical Center in Aurora, Colorado. The Division has no additional comments and hereby approves the Anschutz Medical Campus ACS Management SOP Document.

If you have any further questions or comments please contact me at 303-692-3416 or via e-mail at jeffrey.swanson@state.co.us.

Sincerely,

Jeffrey R. Swanson, P.E.
Federal Facilities Restoration and Reuse Unit
Remedial Program

CC: Tom Butts, Walsh Environmental Scientists and Engineers
    Monica Sheets, CDPHE
    Rob Eber, AGO
    File Copy: RD007-13.1
SECTION 06 10 53 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SYSTEM REQUIREMENTS

A. Design Requirements
   1. Wood studs not permitted. If required and approved by the University Project
      Manager provide fire-retardant-treated lumber.
   2. Select composite wood products with low emissions based on ASTM testing
      standards E1333-10.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wood Products, General:
   1. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal thickness
      or less, 19 percent for more than 2-inch nominal thickness.

B. Wood-Preservative-Treated Materials:
   1. Preservative Treatment: AWPA U1; use Category UC2 except use
      Category UC3b for exterior construction and use Category UC4a for items in
      contact with the ground.
      a. Preservative Chemicals: Containing no arsenic or chromium.
   2. Application: Items indicated and the following:
      a. Items in contact with roofing or waterproofing.
      b. Items in contact with concrete or masonry.
      c. Framing less than 18 inches above ground in crawlspaces.
      d. Floor plates installed over concrete slabs-on-grade.

C. Fire-Retardant-Treated Materials:
   1. Exterior type for exterior locations and where indicated.
   2. Interior Type A, High Temperature (HT) for enclosed roof framing and where
      indicated.
   3. Interior Type A unless otherwise indicated.

D. Miscellaneous Lumber:
   1. Dimension Lumber: Construction or No. 2 grade any species.

E. Plywood Backing Panels: Exterior, AC, fire-retardant treated.

F. Fasteners: Hot-dip galvanized steel where exposed to weather, in ground contact, in
   contact with treated wood, or in area of high relative humidity.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 06 10 53
SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 EXTENDED WARRANTY: Provide a written two-year warranty, signed by Contractor and sealant installer, guaranteeing all exterior joints and interior joints detailed within the Vivarium to be water and air tight for a period of not less than two (2) years from date of the Letter of Acceptance of the Work by the University.

1. Exception: Provide 20 year warranty period from date of the Letter of Acceptance of the Work by the University for sealants used in BSL3 only.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS

A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.

1. Use: For joints in vertical surfaces.

2. Products: Subject to compliance with requirements, provide one of the following:

   a. Dow Corning Corporation; 790.

   b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.

   c. Tremco Incorporated; Spectrem 1.

B. Single-Component, Pourable, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade P, Class 100/50, for Use T.

1. Use: For joints in horizontal traffic surfaces.

2. Products: Subject to compliance with requirements, provide one of the following:

   a. Dow Corning Corporation; 890-SL.

   b. Pecora Corporation; 300 SL.

   c. Tremco Incorporated; Spectrem 900 SL.

C. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 25, for Use NT.

1. Use: For joints in restrooms, janitor’s closets, and other areas subject to continued moisture exposure or high humidity, including door frames and all static joints in ABSL and animal facilities.

2. Products: Subject to compliance with requirements, provide one of the following:

   a. BASF Building Systems; Omniplus.

   b. Dow Corning Corporation; 786 Mildew Resistant.

   c. GE Advanced Materials - Silicones; Sanitary SCS1700.

   d. Tremco Incorporated; Tremsil 200 Sanitary.

D. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Use: For interior door frames and other static joints.

2. Products: Subject to compliance with requirements, provide one of the following:

   a. BASF Building Systems; Sonolac.


   c. Pecora Corporation; AC-20+.

   d. Tremco Incorporated; Tremflex 834.
E. Acoustical Joint Sealant: Nonsag, paintable, nonstaining latex.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Pecora Corporation; AC-20 FTR.
      b. USG Corporation; SHEETROCK Acoustical Sealant.

F. Cylindrical Joint-Sealant Backing: ASTM C 1330, Type C (closed-cell material with a
   surface skin), and of size and density to control sealant depth and otherwise contribute
   to producing optimum sealant performance.

PART 3 - EXECUTION

3.1 INSTALLATION

A. SPECIAL INSTALLATION REQUIREMENTS AT VIVARIUM AND CORE LAB: Provide
   the following for the Vivarium complete and the BSL3 Core Lab. Provide mildew-
   resistant sealant listed above at all conditions listed below:
   1. Ceilings: Fully seal all joints at access panels, light fixtures, electrical devices,
      mechanical devices, fire protection devices, etc.
   2. Walls: Fully seal all joints, including but not limited to, joints between finished wall
      surface and door and window frames, power boxes, plug mold, wire mold, alarm
      and sensor boxes, access panels, electrical devices, plumbing devices, mechanical
      devices, fire protection devices, wall bumper mounting plates, wall plates, wall-mounted
      equipment, window sills and jambs, etc.
   3. Wall and Ceiling Penetrations: Completely seal all penetrations, including but not
      limited to, joints between finished surface and electrical conduits, electrical plugs
      and switches, light fixtures, cover plates, piping for water, gas, vacuum, gas, soil
      and waste lines, mechanical ducts, registers, etc.
   4. Sealant is not required at inside corners of wall-to-wall and wall-to-ceiling joints in
      drywall construction or as a filler in preformed metal control and expansion joints
      in drywall construction.

END OF SECTION 07 92 00
SECTION 08 00 00 - OPENINGS

PART 1 - GENERAL

1.1 SYSTEM REQUIREMENTS

A. Design Requirements:
   1. Design doors to be larger than the width of the largest piece of equipment to be
      installed in the space.
   2. Provide either hollow metal or glazed aluminum storefront for all exterior doors;
      wood doors not permitted.
   3. Provide either hollow metal or solid-core wood for interior doors.
   4. Provide 3'-0" by 7'-0" doors typical; wider doors are permitted if required by
      function and approved by the University Project Manager.
   5. Prepare doors and frames to receive security hardware including door switch
      monitoring devices. Refer to 28 13 00 – Access Control.
   6. All replacement windows must be approved by the University Campus Architect
      and the University Project Manager.
   7. Provide solid doors for vermin control at all OLAR doors.
   8. All-glass doors are prohibited for interior use. Provide wood stile and rail doors
      with glass.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Doors:
   1. Provide all fire-rated doors and frames with an approved UL label.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 08 00 00
SECTION 08 30 50 - ACCESS DOORS

PART 1 - GENERAL

1.1 SUMMARY:

A. Section Includes:
   1. Fire resistive rated and non-rated access doors and frames.
   2. Floor and ceiling access hatches.

B. Related Sections:
   1. Section 033000 - Cast-in-Place Concrete: Openings in concrete.
   2. Section 042000 - Unit Masonry: Openings in masonry.
   5. Section 093000 - Tile: Openings in ceramic tile walls.
   7. Section 099000 - Painting: Field paint finish.
   8. Section 150000 – Mechanical
   9. Section 160000 - Electrical

1.2 QUALITY ASSURANCE:

A. Where fire-rated assemblies are required, provide assemblies complying with NFPA 80 and tested in accordance with ASTM E152.

B. Provide units labeled by UL or Warnock Hersey.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Provide access hatches by one of the following:
   2. The Bilco Co.
   4. Approved substitute.

B. Provide wall and ceiling access doors by one of the following:
   1. Nystrom, Inc. (specified to establish level of quality).
   2. Bar Co., Inc.
   5. Milcor.
   6. The Williams Brothers Corp.
   7. Approved substitute.

2.2 WALL AND CEILING ACCESS UNITS:

A. Fire-Rated Doors: UL label appropriate to assembly rating. Provide units which are self-closing and latching.
B. **Access Panels - Masonry Walls:** Flush, Style TM by Nystrom, 16 gage frame, 14 gage panel, concealed spring hinges, masonry anchors.

C. **Access Panels - Gypsum Board Walls and Ceilings:** Flush, Style WB by Nystrom, 16 gage frame, 14 gage panel, galvanized steel drywall bead, concealed spring hinges.

D. **Access Panels - Acoustical Tile Ceilings:** Recessed to receive acoustical tile, Style RA by Nystrom, 16 gage steel frame, 16 gage panel, concealed pivoting rod hinge. Acoustic tile installed under Section 09510.

E. **Access Panels - Plaster:** Flush, Style PW by Nystrom, 16 gage frame, 14 gage panel, galvanized steel plaster bead with expanded metal lath, concealed spring hinges.

F. **Access Panels - Ceramic Tile:** Flush, Style WB by Nystrom, 16 gage frame, 14 gage panel, concealed spring hinges.

G. **Access Panels - Concrete:** Flush, Style TM by Nystrom, 16 gage frame, 14 gage panel, concealed spring pin hinge.

H. **Sizes:**
   1. **Hand Access:** 18" x 18" minimum; 24" x 24" preferred.
   2. **Person Access:** 24" x 24" minimum.

I. **Finish:** Phosphate dipped with baked on rust inhibitive gray primer.

J. **Locking:**

   **VERIFY CYLINDER LOCKING LOCATIONS WITH UCD STAFF**
   1. **Non-Rated Areas:** Flush, flat-screw-driver operated cam latch.
   2. **Fire-Rated Areas:** Raised knob cam locks.
   3. **Special Areas as Designated:** Cylinder locks with all units keyed alike.
   4. **In walls adjacent to restrooms and bathrooms:** Tamper-proof-head operated cam latch.

2.3 **ACCESS HATCHES:**

A. **Design:**
   1. **Installation:** Recessed.
   2. **Finish:** To receive floor or ceiling finish as scheduled, if in a public area.

B. **Location:** Accessible in a non-public location if possible.

**PART 3 - EXECUTION**

**NOT USED**

**END OF SECTION 083050**

08 30 50 - 2
Access Doors
SECTION 09 00 00 - FINISHES

PART 1 - GENERAL

1.1 SYSTEM REQUIREMENTS

A. Design Requirements:
   1. Interior design color palette proposed by the Design Professional must meet all
criteria established with input and approval by the University Campus Architect
through the University Project Manager.
   2. Provide rubber base at both carpet and resilient flooring installations. Upgrades
are permissible with approval of the University Campus Architect through the
University Denver Project Manager.
   3. All penetrations and/or seams in materials in BSL3, Vivaria, and other similar
functional areas are to be sealed, unless otherwise noted.

B. Performance Requirements:
   1. Fire-Test-Response Characteristics:
      a. Surface-Burning Characteristics: As determined by testing per ASTM E 84.
         1) Flame-Spread Index: 25 or less.
         2) Smoke-Developed Index: 25 or less.
         3) Fuel Contributed Index: 15 or less.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 PREPARATION OF CONCRETE TO RECEIVE MOISTURE SENSITIVE FLOORING

A. Prepare all concrete substrates to receive moisture sensitive floor finishes including,
but not limited to, resilient sheet floor, linoleum flooring, resilient tile flooring, resinous
matrix terrazzo flooring, resinous flooring, sheet carpeting and tile carpeting, according
to ASTM F 710 and the following:
   1. Verify that substrates are dry and free of curing compounds, sealers, and
      hardeners.
   2. Remove substrate coatings and other substances that are incompatible with
      adhesives and that contain soap, wax, oil, or silicone, using mechanical
      methods recommended by manufacturer. Do not use solvents.
   3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
      Proceed with installation only after substrate pH is between 7.0 and 9.0.
   4. Moisture Testing: Perform tests recommended by manufacturer and as follows.
      Proceed with installation only after substrates pass testing.
      a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with
         installation only after substrates have maximum moisture-vapor-emission
         rate of 3 lb of water/1000 sq. ft. in 24 hours.
      b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed
         with installation only after substrates have a maximum 80 percent relative
         humidity level measurement.
B. Provide moisture vapor emissions and alkalinity control system to all concrete substrates that fail alkalinity and/or moisture testing.

END OF SECTION 09 00 00
SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SYSTEM REQUIREMENTS

A. Design Requirements:
   1. Space studs at 16 inches on center maximum.
   2. Where interior partitions do not extend to the underside of structure, extend partition 6” above the ceiling grid and brace to structure at 4 feet on center.

B. Performance Requirements:
   1. Partitions, General: Provide metal framing systems of base-metal thickness and spacing capable of limiting lateral deflections when subjected to a 5 psf uniform lateral load to the following:
      a. L/240 where supporting gypsum board only.
      b. L/360 where supporting plaster or ceramic tile finishes.
      c. L/720 where providing backup to stone or masonry.
   2. Partitions Enclosing Pressurized Mechanical Rooms: Provide metal framing systems of base-metal thickness and spacing capable of limiting lateral deflections to L/240 when subjected to a 15 psf uniform lateral load or the design value induced by the mechanical system, whichever is greater.
   3. Suspended Ceiling Design Requirements: Provide metal framing systems of base-metal thickness and spacing capable of limiting ceiling deflections to L/360 when subjected to a minimum 4 psf uniform load or the actual weight of ceiling hung materials, whichever is greater.
   4. Engineering design of non-structural metal framing by Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel Framing for Framed Assemblies:
   1. Steel studs and runners: 0.033-inch-thick (20 gauge) minimum.
   2. Dimpled steel studs and runners: 0.025-inch-thick minimum, with structural properties equivalent to 0.0329-inch-thick steel studs.

PART 3 - EXECUTION (Not Applicable)

3.1 INSTALLATION

A. Secure with fasteners or proper crimping tools; do not weld.

END OF SECTION 09 22 16
SECTION 09 29 00 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SYSTEM REQUIREMENTS

A. Design Requirements
   1. Design all walls within a vivarium to have a sound transmission class (STC) rating of 55 or better.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Interior Gypsum Board:
   1. Gypsum board, Type X: Provide 5/8 inch thick, typical unless noted otherwise.
   2. Abuse-resistant gypsum board: Provide at service corridors.
   3. Moisture- and mold-resistant gypsum board. Provide at all high humidity areas.

B. Exterior Gypsum Board for Ceilings and Soffits:

C. Tile-Backiing Panels:
   1. Glass-mat, water-resistant backing board.

D. Trim Accessories:
   2. Exterior: Hot-dipped galvanized steel sheet or rolled zinc.

E. Auxiliary Materials
   1. Sound attenuation blankets.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Finishing Gypsum Board Assemblies:
   1. Levels of Gypsum Board Finish: At a minimum, comply with recommendations in GA-214, “Recommended Levels of Gypsum Board Finish.”

END OF SECTION 09 29 00
SECTION 09 51 13 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SYSTEM REQUIREMENTS

A. Design Requirement:
   1. Provide patterns, colors and finishes approved by the University Campus Architect through the University Project Manager.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Acoustical Ceiling Panels: Fire-resistance rated where required; ASTM E 1264.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Armstrong World Industries, Inc.
      b. CertainTeed Corp.
      c. USG Interiors, Inc.
   2. Type and Form for typical installations: Type III, Form 1, nodular; sag resistant with anti-microbial treatment.
   3. Type and Form for Laboratories: Type IV, mineral base with membrane overlay; Form 2, water felted; with fiberglass-fabric face; sag resistant with anti-microbial treatment.
   5. LR: Approximately 0.90.
   6. NRC: Approximately 0.70.
   7. CAC: Approximately 35.
   8. Thickness: 3/4 inch.
   9. Modular Size: 24 by 24 inches or 24 by 48 inches scored to look like 24 by 24 inches.

B. Metal Suspension Systems: ASTM C 635.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Armstrong World Industries, Inc.
      b. CertainTeed Corp.
      c. Chicago Metallic Corporation.
      d. USG Interiors, Inc.
   2. Wire hangers, braces, and ties.

C. Metal Edge Moldings and Trim: Roll-formed sheet metal.

D. Ceiling Panel Plenum Access, Identification Markings:
1. Removable ceiling tiles may provide access to mechanical and electrical components located above the ceiling. Where required, mark ceiling panel with colored map tacks glued in place according to the following:
   a. Waste Valves and Unions: Blue.
   b. Waste Cleanouts: Black.
   c. Ventilation Test Areas and Dampers: Purple.
   d. Fire Dampers or Fire Detectors: Red.
   e. Electrical transformers or resistance heaters: Orange.
   f. Natural Gas, Oxygen, and Steam Valves or Unions: Yellow.
   g. Nitrogen, Compress Air, and Vacuum Valves or Unions: Green.
   h. Miscellaneous Mechanical Items: Gray.

PART 3 - EXECUTION

3.1 INSTALLATION


END OF SECTION 09 51 13
SECTION 09 68 13 - TILE CARPETING

PART 1 - GENERAL

1.1 SUBMITTALS

A. Review shop drawings for pattern match, if any, for matching during installation and possible waste factors in ordering required amounts. Provide copy of approved shop drawings on job site during installation.

B. Verification Samples: Submit two full size samples illustrating color and pattern for each carpet material specified.

C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.2 QUALITY ASSURANCE

A. Manufacturer Qualifications
   1. Upon request, provide a representative to assist in project start-up and to inspect installation while in process and upon completion.
      a. Representative will notify designated contact if any installation instructions are not followed.
      b. Representative will be present at 6 month and 11 month punch walks.
   2. 5-year documented experience in manufacturing of carpet tile.

B. Installer Qualifications
   1. Flooring contractor must be certified by the carpet manufacturer prior to bid.
   2. Flooring contractor to be a specially contractor normally engaged in this type of work and has prior experience in the installation of carpet tiles.
   3. Flooring contractor will be responsible for proper product installation, including floor testing and preparation, as specified by the carpet manufacturer and job conditions herein.

C. Single Source Responsibility: Obtain each type of carpet from one source and by a single manufacturer.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the site in manufacturer's original packaging listing manufacturer's name, product name, identification number, and related information.

B. Store in a dry location, between 60 degrees F and 80 degrees F and a relative humidity below 65%. Protect from damage and soiling. Stack carpet in boxes.

C. Make stored materials available for inspection by The University's representative.

D. Store materials in area of installation for minimum period of 48 hours prior to installation.
1.4 PROJECT CONDITIONS

A. Sub-floor preparation is to include all required work to prepare the existing floor for installation of the product as specified in this document and Manufacturer’s installation instructions.

B. Comply with 09 00 00 – Finishes, Part 3.1 for preparation of concrete to receive moisture sensitive flooring.

C. Provide all material used in sub-floor preparation and repair as recommended by the carpet manufacturer and chemically and physically compatible with the carpet system being bid.

D. Maintain minimum 65 degrees F ambient temperature and 65% Relative Humidity for 72 hours prior to, during, and 48 hours after installation.

E. Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.

F. Extra Materials: Refer to Section 01 78 46 – Extra Stock Materials.

1.5 WARRANTY

A. Warranty to be sole source responsibility of the Manufacturer. Second source warranties and warranties that involve parties other than the carpet manufacturer are unacceptable.

B. If the product fails to perform as warranted when properly installed and maintained, repair or replace the affected area at the discretion of the Manufacturer.

C. Chair Pads are not required for carpet warranty coverage.

D. Include carpet product installed on stairs in warranty provided it is properly installed and maintained.

E. Provide warranty for a specifically defined non-prorated period of 15 years to cover the following. “Lifetime” warranties are not acceptable.
   1. Excessive Surface Wear: More than 10% loss of pile fiber weight
   2. Excessive Static Electricity: More than 3.5 kV per AATCC 134; 3.0 kV in areas of heavy electronic usage
   3. No Delamination
   4. No Edge Ravel
   5. No Zippering

F. Provide an additional warranty for a minimum non-prorated period of two years and cover against shrinkage, cupping, and doming.

G. Tuft Bind warranty in lieu of edge ravel and zipper is not acceptable.
PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. CARPET

1. Nylon Fiber: Fiber must be premium branded nylon. Mill extruded nylon will not be accepted. 100% type 6,6 bulk continuous filament (BCF) nylon. Hollow filament fiber shape for optimal soil hiding capability. A modification ratio of less than 1.5. Polymer identification to AATCC TM 20.
2. Construction: Texture - level loop or textured loop with maximum pile height variation of 1/32 inch.
4. Pile Density: Minimum 5500 for heavy or severe traffic.
5. Dye Method: Fiber to be minimum 75% solution dyed; 95% preferred.
6. Stain Resistance: AATCC TM 171 (HWE) for 2 cleanings to simulate removal of topical treatments by hot water extraction, followed by AATCC TM 175 Stain Resistance test; minimum rating of 8 using AATCC Red 40 Stain Scale.
7. Soil Resistance: Soil resistance treatment to be heat cured by mill during manufacturing process.
8. Coloration/Patterning: Minimum five (5) color hues. Recommended: Hue values to be in medium to medium-dark range with random or complex patterning for optimum soil hiding capability. Restrict solid color carpet to accent areas. Do not use light colors.

2.2 BACKING CHARACTERISTICS

1. Primary Backing: Synthetic Woven or Non-Woven.
2. Pre-Coat (Fusion Coat): Sealant Vinyl
3. Secondary Backing: Vinyl Closed Cell. 100% reclaimed-content, nylon reinforced vinyl matrix backing is preferred and should be provided if available.
   a. High performance, moisture impermeable modular, vinyl
   b. 24” x 24”, or 60cm, or 36” x 36”

2.3 PERFORMANCE CHARACTERISTICS

A. Test reports for the following performance assurance testing to be submitted upon request. Submitted results shall represent average results for production goods of the referenced style.

B. Requirements listed below must be met by all products.

1. Flooring Radiant Panel; ASTM E-648 / NFPA 253: Class 1 (CRF: 0.45 watts/sq cm or greater)
2. Federal Flammability : CPSC FF 1-70: Passes (must pass Methenamine Pill test, ASTM D2859 test method)
4. Electrostatic Propensity: AATCC TM 134 (Step & Scuff): 3.5 kV or less by permanent means (i.e. antistatic filaments) and without chemical treatment. 3.0 kV in areas of heavy electronic usage
5. Static Coefficient of Friction: ASTM C-1028: Passes ADA Requirements for Accessible Routes (minimum 0.60)
7. Dimensional stability: Aachen method/ ISO 2551. Maximum change +/- 0.20%  
9. Colorfastness to Light: AATCC TM 16.3 to 200 AFU; minimum rating 3-4 using AATCC Grey Scale for color change.  
10. Colorfastness to atmospheric contaminants: AATCC TM 164 (resistance to fade from oxides of nitrogen) and AATCC TM 129 (resistance to fade from ozone) for 2 cycles; minimum rating of 3-4 using AATCC Gray Scale for Color Change.  
11. Colorfastness to crocking: AATCC TM 165, minimum rating of 4 using the AATCC Chromatic Transference Scale. Texture Retention: Vettermann Drum: ASTM D-5417: Minimum 3.5 @ 22,000 cycles or Hexapod Test Method, ASTM D5252, for 12,000 cycles (8.4 lb tumbler) with a minimum rating of a 3.5 Rating using the appropriate Commercial Reference Scale for the construction per ASTM D7330 test method. Testing without underpad or brushing.  
12. Moisture Barrier: Moisture Penetration by Impact Test: No penetration of backing after 10,000 impacts @ 10 psi.  

15. SUSTAINABILITY  
16. NSF/ANSI 140 the Sustainability Assessment for Carpet.  
   a. VOC Chamber Testing  
   b. ASTM D-5116: Product inclusive of “dry” adhesive system meets criteria established by the State of Washington Indoor Air Quality Specification for Carpet and/or Carpet & Rug Institute’s (CRI) Indoor Air Quality Carpet Testing Program. If “dry” adhesive (2.02D) not available from manufacturer and “wet” adhesive is used to install the product, carpet and adhesive to meet CRI’s Green Label requirements.  

2.4 SUBSTITUTES/ALTERNATES  

A. Subject to compliance with all requirements, “or equal” must match the selected colors, have similar aesthetic, and meet performance criteria. Substitution sample and submittals to be considered must be submitted for written approval of quality and color in accordance with bidding documents. Sample of proposed substitute must be inclusive of both the face and proposed backing (color-only sample not acceptable).  

2.5 ACCESSORIES  

A. Adhesives: Product to be installed using manufacturer’s recommended adhesive. Non adhesive methods are preferred and should be provided if available.  

PART 3 - EXECUTION  

3.1 EXAMINATION  

A. Prepare sub-floor to comply with criteria established in Manufacturer’s installation instructions. Use only preparation materials that are acceptable to the Manufacturer.  
   1. Remove all deleterious substances from substrate(s) that would interfere with or be harmful to the installation. (i.e. floor wax)  
   2. Remove sub-floor ridges and bumps. Fill cracks, joints, holes, and other defects.
B. Verify that sub-floor is smooth and flat within specified tolerances and ready to receive carpet.

C. Verify that substrate surface is dust-free and free of substances that would impair bonding of product to the floor.

D. There will be no exceptions to the provisions stated in the Manufacturer's installation instructions.

3.2 INSTALLATION, GENERAL

A. Where demountable partitions or other items are indicated for installation on top of finished carpet tile floor, install carpet tile before installation of these items.

B. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.

C. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

D. Install borders parallel to walls (where applicable).

E. Trim carpet neatly at walls and around interruptions.

F. Completed carpet is to be smooth and free of bubbles, puckers, and other defects.

3.3 TESTING, CLEANING, AND CERTIFICATION

A. Remove excess adhesive and/or seam sealer from floor and wall surfaces without damage.

B. All rubbish, wrappings, debris, trimmings, etc. to be removed from site and disposed of properly.

C. Clean and vacuum carpet surfaces per manufacturer's instructions.

D. After each area of carpet is installed, protect from soiling and damage by other trades.

END OF SECTION 09 68 13
SECTION 09 91 23 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SYSTEM REQUIREMENTS

A. Design Requirements:
   1. Single-Source Responsibility: Provide primers and undercoats produced by and
certified compatible with each other and with topcoat.
   2. Quality: Provide manufacturer’s first line commercial products.
   3. Locally Available: Provide products readily available within the Denver
   metropolitan area in 1- and 5-gallon containers. Readily available means within
   24-hours of placing order.
   4. Dry Film Thickness (DFT): Apply all coatings in strict conformance with
   manufacturer’s recommendations for minimum DFT.

1.2 SUBMITTALS

A. MSDS: Contractor to provide Material Safety Data Sheets (MSDS) for all coatings to
the University Project Manager prior to application.

1.3 QUALITY ASSURANCE

A. MPI Standards: Provide products that comply with Master Painter Institute (MPI)
standards indicated and that are listed in its "MPI Approved Products List."

   B. All painting must be of journeyman level craftsmanship, paying special attention to
   preparation, etching, priming and undercoating.

PART 2 - PRODUCTS

2.1 BLOCK FILLERS

A. Block Filler, Acrylic/Latex, Interior/Exterior for Concrete Masonry Unit Substrates: MPI
   #4

2.2 PRIMERS/SEALERS

A. Primer, Alkali Resistant, Water Based, for Concrete Substrates: MPI #3

   B. Primer Sealer, Interior, Institutional Low Odor/No VOC, for Gypsum Board and Plaster
   Substrates: MPI #149

   C. Primer, Latex, for Interior Wood Substrates: MPI #39

   D. Wood-Knot Sealer: Sealer recommended in writing by topcoat manufacturer for use in
   paint systems indicated.

2.3 METAL PRIMERS

   A. Primer, Rust-Inhibitive, Water Based, for Ferrous-Metal Substrates: MPI #107
B. Primer, Galvanized, Water Based, for Zinc-Coated Metal Substrates: MPI #134
C. Primer, Quick Dry, for Aluminum Substrates: MPI #95

2.4 WATER-BASED PAINTS

A. Latex, Interior, Gloss (Gloss Level 6, except minimum gloss of 65 units at 60 degrees): MPI #114.
B. Latex, Interior, Institutional Low Odor/No VOC, Flat (Gloss Level 1): MPI #143.
C. Latex, Interior, Institutional Low Odor/No VOC, Egg-Shell (Gloss Level 2) MPI #144 or (Gloss Level 3) MPI #145.
D. Latex, Interior, Institutional Low Odor/No VOC, Semi-Gloss (Gloss Level 5): MPI #147.

2.5 DRY FOG/FALL COATINGS

A. Dry Fall, Latex, Flat: MPI #118.
B. Dry Fall, Water Based, for Galvanized Steel, Flat (Gloss Level 1): MPI #133.

2.6 FLOOR COATINGS

A. Sealer, Water Based, for Concrete Floors: MPI #99.

PART 3 - EXECUTION

3.1 INTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces: The following system is acceptable, high performance coating specified in SECTION 09 96 00 preferred.
1. Institutional Low-Odor/No VOC Latex System: MPI INT 3.1M
   a. Prime Coat: Primer sealer, interior, institutional low odor/No VOC, MPI #149.
   c. Topcoat: Latex, interior, institutional low odor/No VOC, semi-gloss (Gloss Level 5), MPI #147.

B. Concrete Substrates, Traffic Surfaces: At all concrete traffic surfaces scheduled to receive sealer.
1. Water-Based Clear Sealer System: MPI INT 3.2G
   a. First Coat: Sealer, water based, for concrete floors, MPI #99.
   b. Topcoat: Sealer, water based, for concrete floors, MPI #99.

C. CMU Substrates: The following system is acceptable, high performance coating specified in SECTION 09 96 00 preferred.
1. Institutional Low-Odor/No VOC Latex System: MPI INT 4.2E

09 91 23 - 2
Interior Painting
c. Topcoat: Latex, interior, institutional low odor/No VOC, semi-gloss (Gloss Level 5), MPI #147.

D. Steel Substrates: At all steel substrates not indicated to receive high-performance coatings specified in SECTION 09 96 00.
   1. Water-Based Dry-Fall System (for overhead work only): MPI INT 5.1C
      a. Prime Coat: Shop primer to be specified in Division 05.
      b. Topcoat: Dry fall, latex, flat, MPI #118.
   2. Institutional Low-Odor/No VOC Latex System: MPI INT 5.1S
      c. Topcoat: Latex, interior, institutional low odor/No VOC, semi-gloss (Gloss Level 5), MPI #147.

E. Galvanized-Metal Substrates: At all galvanized metal substrates not indicated to receive high-performance coatings specified in SECTION 09 96 00.
   1. Water-Based Dry-Fall System (for overhead work only): MPI INT 5.3H
      a. Prime Coat: Dry fall, water based, for galvanized steel, flat (Gloss Level 1), MPI #133.
      b. Topcoat: Dry fall, water based, for galvanized steel, flat (Gloss Level 1), MPI #133.
   2. Institutional Low-Odor/No VOC Latex System: MPI INT 5.3N
      a. Prime Coat: Primer, galvanized, water based, MPI #134.
      c. Topcoat: Latex, interior, institutional low odor/No VOC, semi-gloss (Gloss Level 5), MPI #147.

F. Aluminum (Not Anodized or Otherwise Coated) Substrates:
   1. Institutional Low-Odor/No VOC Latex System: MPI INT 5.4G
      a. Prime Coat: Primer, quick dry, for aluminum, MPI #95.
      c. Topcoat: Latex, interior, institutional low odor/No VOC, semi-gloss (Gloss Level 5), MPI #147.

G. Wood Substrates:
   1. Institutional Low-Odor/No VOC Latex System: MPI INT 6.1Q, MPI INT 6.2L, MPI INT 6.3V, and MPI INT 6.4T
      a. Prime Coat: Primer, latex, for interior wood, MPI #39.
      c. Topcoat: Latex, interior, institutional low odor/No VOC, semi-gloss (Gloss Level 5), MPI #147.

H. Gypsum Board and Plaster Substrates:
   1. Latex System: MPI INT 9.2A. At gypsum board, GFRG, and plaster substrates scheduled to receive gloss paint.
      a. Prime Coat: Primer sealer, latex, interior, MPI #50.
c. Topcoat: Latex, interior; gloss, (Gloss Level 6, except minimum gloss of 65 units at 60 degrees), MPI #114.

2. Institutional Low-Odor/No VOC Latex System: MPI INT 9.2M. At all gypsum board, GFRG, and plaster substrates, unless indicated otherwise.
   a. Prime Coat: Primer sealer, interior, institutional low odor/No VOC, MPI #149.
   c. Topcoat: Latex, interior, institutional low odor/No VOC; Provide one of the following as indicated in Finish Schedule:
      1) Flat (Gloss Level 1), MPI #143
      2) Egg-shell (Gloss Level 2), MPI #144 or (Gloss Level 3), MPI #145
      3) Semi-gloss (Gloss Level 5), MPI #147

   d. Typical Sheen: Egg-shell (Gloss Level 2 or 3) unless indicated otherwise.

END OF SECTION 09 91 23
SECTION 260100
BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Basic requirements for electrical systems common to Division 26 Sections, supplemental to Division 01 requirements.

1.02 RELATED REQUIREMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Sections, apply to the Division 26 Sections.

1.03 DEFINITIONS
A. Architect: The lead design consulting firm and associated consulting engineering firm. On projects where the lead design consultant is the engineer rather than the architect, Architect refers to the lead consulting engineer.
B. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, areas above ceilings, furred cavities, chases, unexcavated spaces, crawlspace, and tunnel.
C. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
D. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include facades and roofs.
E. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include chases and areas above ceilings.
F. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include areas under large canopies and unheated shelters.

1.04 SUMMARY
A. The electrical work includes building system upgrades, system modifications, and system replacements.
B. Provide equipment, materials, and labor necessary for the complete installation, start-up, and testing of the electrical systems.
C. Comply with Owner design, construction, and building standards.
D. Examine the project site to become familiar with the existing conditions prior to the bid. Additional costs to the Owner will not be accepted for additional work associated with existing conditions.
E. Commissioning is a project requirement. Provide labor and documentation necessary for the complete testing and commissioning of the electrical systems.
F. Verify existing field conditions prior to submitting bids.
G. When submitting bid forms, the Owner may request that the contractor submit qualifying information regarding three similar projects (in project type, value and magnitude) completed within the last 5 years.
H. Report existing damaged equipment or systems to the Owner prior to commencing work.
I. Coordinate and co-operate with the Owner for system interconnections and testing for the duration of construction.
J. Coordinate and co-operate with the Owner for system upgrades, modifications, and replacements for the duration of construction.
K. Coordinate with Owner for required shutdown and restart of service and distribution systems, provide temporary services as necessary if not indicated on the drawings. At least thirty (30) days prior to shutdown submit a detailed MOP to the University Facilities Maintenance Electrical Engineer for review and approval.
L. Where required to maintain operations in existing areas, provide temporary wiring and protection as necessary if not indicated on the drawings.

M. Maintain continuity of power, communications, and life safety equipment to areas occupied during construction.

N. Protect mechanical and electrical work against theft and damage for the duration of construction.

O. Do not damage property of the Owner or the work of other trades for the duration of construction and the guarantee period. Repair or replace portions of the installation that show defect during the period of one year, or longer if otherwise indicated, from Owner final acceptance provided the defect is due to imperfect material or faulty workmanship as determined by the Architect, and not due to Owner carelessness or improper use.

1.05 REGULATORY REQUIREMENTS

A. Refer to Division 01.

B. Execute and inspect work in accordance with applicable national and state codes, local ordinances and regulations, and the requirements of the authority having jurisdiction. Follow the more stringent requirement of applicable codes, regulations, or that shown on the Contract Documents where it exceeds codes or regulations. Comply with applicable standards, requirements, and testing procedures of applicable institutes and agencies, including ANSI, IBC, ICEA, IEEE, NEC, NECA, NEMA, NETA, NFPA, and OSHA.

C. Provide Underwriters Laboratories (UL) listed electrical equipment and materials suitable for the intended purpose as determined by the authority having jurisdiction. Electrical equipment and materials shall bare a UL label.

D. Comply with standards in effect at the date of the Contract Documents, except where a standard or specific date or edition is indicated.


F. Comply with all campus standards. Obtain a copy of the current standards prior to bid.

1.06 UTILITY COMPANY REQUIREMENTS

A. Coordinate existing electrical service deactivation, replacements, upgrades, reactivation, energization, and temporary services with the Owner, Architect, and utility companies.

1.07 PERMITS AND FEES

A. Refer to Division 01.

B. Schedule and pay costs of required electrical inspections, licenses, and certificates in connection with the work.

C. Do not commence work prior to securing the necessary and required permits.

1.08 REQUEST FOR INFORMATION

A. Prior to completion of the bid, request clarifications to the Contract Documents for conflicts noted between the drawings and specifications. Without clarification, the bid shall be based on the most stringent requirement identified in the Contract Documents.

B. During construction, request clarifications and information wherever the Contract Documents are not clear. Obtain clarification from the Architect prior to equipment and material selection, purchase, rough-in, and installation.

1.09 SUBMITTALS

A. Refer to Division 01.

B. The Contractor shall provide a submittal schedule for all items that require submittals within four weeks of entering into the contract.

C. Product Lead Times:
1. For all submittals, the Contractor shall obtain the lead time from the manufacturer and shall notify the Prime Contractor of any lead times that may adversely impact the project schedule. Submittals that may adversely impact the project schedule shall be prioritized by the Contractor for prompt submission to the Engineer. No additional cost will be allowed for schedule delays that result from submittals not being provided promptly or that do not comply with the contract documents.

2. The Contractor shall identify any long lead time items which may impact the overall schedule. If these submittal requirements affect the schedule, the Contractor shall identify the impacts and confer with the Engineer within two weeks of entering into the contract.

D. Both the Installing Contractor and the Prime Contractor shall ensure that each submittal is provided in a timely manner and is arranged, organized, and annotated to facilitate a prompt review. They shall further ensure the following:
   1. Submittals are complete and clearly identify the products, options, and accessories intended to be furnished for the project.
   2. Submittals fully comply with the contract documents, including but not limited to specifications, details, notes, and schedules.
   3. All submittal pages are legible and electronically searchable.
   4. All items intended for use are specifically identified with annotation as required in this section.
   5. Items returned as "Reviewed" or "Make Corrections Noted" shall be omitted from subsequent submittals. The Contractor shall cloud all changes made on submittals that are marked "Revise and Resubmit."
   6. Items that do not fully comply with the contract documents shall be identified on the submittal, and explanatory information shall be provided that justifies the reasons for all deviations.

E. Excessive Submittals
   1. A third review of the same submittal shall be subject to back-charging the Contractor for the design team's time and effort. The design team's time will be billed directly to the Contractor at current hourly rates and may be deducted from future payments owed to the Contractor.
   2. Submittals shall be limited to a single manufacturer for any product that requires a submittal. Should products from additional manufacturers be submitted, the Contractor agrees to reimburse the design team for the time to review products from multiple manufacturers. The design team's time will be billed directly to the Contractor at current hourly rates and may be deducted from future payments owed to the Contractor.
   3. Submittals that are not required may be returned without comment.

F. Equipment selection and submittals shall conform to the energy conservation codes and standards.

G. Shop drawings, product data, and sample submittals will be reviewed only when submitted and stamped by the Contractor. Data submitted from subcontractors and material suppliers directly to the Architect will not be processed unless prior written approval is provided by both the Architect and Contractor.

H. Prepare and submit shop drawings and product data before commencing work. Submit electronic Portable Document Format (.PDF) searchable files and the number of hardcopies specified. Revise and submit shop drawings, after each reviewer's action, until a "No Exception Taken" or "Make Corrections Noted" action is received. Submittals shall include equipment and materials specified in individual Division 26 Sections. Make additional prints or copies of electronic submittals as required for Contractor and other subcontractor use.
   1. Engineer is not responsible for resubmittals or tracking progress of resubmittals.
   2. Returned submittals are not change orders and do not give the Contractor authorization to deviate from the specification or the contracted price for the project.

I. Identify each submittal and item with specification section number and sufficient data matching the nomenclature indicated on the drawings to allow timely and efficient review for compliance with the Contract Documents. Submittals that are not identified by specification section number
and description, or that lack sufficient data to identify location, use, and compliance with the
Contract Documents will be returned "Revise and Resubmit."

J. Initial shop drawing and product data submittals that are unclear or incomplete will not be
reviewed and will be returned "Rejected."

K. Resubmittals that are incomplete or do not clearly address each prior review comment will not
be reviewed and will be returned "Rejected."

L. Clearly identify the selection of applicable models, characteristics, features, accessories,
options, and the like on submittals of manufacturer product data and shop drawings with type
written numbers and descriptions, colored highlights and box-outs, and other suitable
designations. Product data submittals comprised of basic manufacturer's brochures, catalogs,
manuals, and cut-sheets that do not clearly identify the series, model, characteristics, features,
accessories, options, and the like will not be reviewed and will be returned "Rejected."

M. The Design Professional's review shall be conducted with reasonable promptness while
allowing sufficient time in the Design Professional's judgement to permit adequate review.
Review of a specific item shall not indicate that the Design Professional has reviewed the entire
assembly of which the item is a component.

N. Contractor shall be solely responsible for complying with the Contract Documents, as well as
with Supplier instructions consistent with the Contract Documents, Owner's directions, and
Laws and Regulations. Contractor is solely responsible for obtaining, correlating, confirming,
and correcting dimensions at the site; quantities; information and choices pertaining to
fabrication processes; means, methods, sequences, procedures, and techniques of
construction; safety precautions and programs incident thereto; and for coordinating the work of
all trades.

O. Submit proposed changes to electrical room or other equipment room layouts when revised
from contract documents prior to installation.

P. Provide submittals including shop drawings, product data, checklists, tests and reports, training,
extra material, coordination drawings, record drawings, O&M Manuals, device setting reports,
and software licenses per individual specification sections.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Refer to Division 01.

B. Deliver products to project within adequate packaging and protection to prevent damage during
shipment, storage, handling, and with proper identification of purchasing party name, product
description, model numbers, types, grades, compliance labels, and similar information.

C. Upon delivery, verify actual equipment nameplate data concurs with product and shop drawing
data.

D. Store equipment and materials at the site, unless off-site storage is authorized by the Architect.
Protect stored equipment and materials from damage, dirt, dust and moisture.

E. Coordinate deliveries of equipment and materials to avoid and minimize construction site
congestion. Limit each shipment of equipment and materials to the items and quantities
needed for on-time and efficient work flow.

F. Provide factory-applied plastic end-caps on threaded conduit. Maintain end-caps through
shipping, storage, and handling to prevent thread damage and entrance of dirt, debris, and
moisture.

G. Protect equipment, fixtures, and specialties from moisture and dirt by providing indoor tempered
storage and enclosure. Package with durable and waterproof wrapping for delivery and
storage during adverse conditions.

1.11 TEMPORARY FACILITIES

A. Include provisions and costs for temporary electricity, lighting, power, heating, and other
facilities if not specified as provided by others in Division 01.

B. Do not use permanent building equipment for temporary light, power, heating, and cooling
without written permission from the Owner. If the equipment is used temporarily, maintain the

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Basic Electrical Requirements
equipment in accordance with the manufacturer's instructions. The guarantee period begins when the equipment is turned over and final acceptance is provided by the Owner.

1.12 ACCESSIBILITY

A. Install equipment and materials to provide required code clearances and access for servicing and maintenance. Coordinate the final location of concealed equipment, fixtures, outlets, devices, boxes, and enclosures requiring access with final location of required access panels and doors. Allow ample space to provide code required clearance and the removal of parts requiring replacement or servicing.

B. Locate boxes, enclosures, and other wiring junctions at accessible locations.

C. Furnish hinged steel access panel doors with concealed latch, whether or not indicated, in walls and ceilings for access to concealed equipment, fixtures, outlets, devices, boxes, and enclosures. Refer to Division 08 Sections for access door and access panel requirements.

D. The minimum access panel size for boxes shall be 12 inches by 12 inches.

E. Factory manufactured doors shall be of a type compatible with the adjacent finish and construction.

F. Access doors in fire-rated walls and ceilings shall have equivalent UL label and fire rating.

1.13 OBSERVATIONS BY ENGINEER

A. Remove and replace covers of electrical distribution equipment to permit observation of equipment, and wiring.

B. Remove and replace lay-in ceiling tiles to permit observation of ceiling spaces.

   1. Furnish ladder.

1.14 ROUGH-IN

A. Verify final rough-in locations with field measurements and the configuration of the actual equipment to be connected.

B. Locations of electrical equipment and materials identified on the drawings are approximate, unless dimensioned or otherwise indicated. Coordinate locations of electrical equipment, fixtures, outlets, devices, and the like with field conditions and other trades. Locate outlets and devices, including wall switches so not to be confined behind open doors and casework. Locate receptacle devices within 18 inches of associated communication outlets.

C. Refer to equipment shop drawings for the actual equipment supplied and the associated rough-in requirements. Make electrical adjustments as required to complete the installation.

1.15 INSTALLATION

A. Drawings are diagrammatic in character and do not necessarily include all material details to complete the electrical installation.

B. Drawings and specifications are complementary; whatever is called for in either is to be considered as called for in both. If there is a conflict in the Contract Documents, then the most stringent requirement applies.

C. Do not scale electrical drawings for determining measurements, linear take-offs, or for the coordination of rough-ins. Refer to architectural dimensioned drawings as necessary. Perform and record field measurements where dimensions are required for equipment, materials, and the preparation of shop drawings.

D. Before equipment and materials are installed, confirm its fit within the allowed space along with code required clearances, without interferences between systems, structural elements, and the work of other trades.

E. Schedule, sequence, and integrate the electrical installation for efficient work flow in coordination with other trades.

F. Coordinate the installation of equipment and materials above and below ceilings with structural and suspension systems, and mechanical, plumbing, fire protection, and other building systems and components.
1. Direct other trades not to install ductwork and piping above electrical switchboard, panelboards, motor control centers, transformers, transfer switches, and the like; notify the Architect when and where these conditions are not met. No piping may be within electrical rooms unless it serves the electrical room.

2. Coordinate ceiling cavity space carefully with other trades. In the event of conflict, install mechanical and electrical systems within the cavity space in the following order of priority:
   a. Plumbing waste, roof drainage, and vent piping.
   b. Supply, return and exhaust ductwork.
   c. Fire sprinkler mains and leaders.
   d. Electrical conduit and boxes.
   e. Domestic hot and cold water.
   f. Fire sprinkler branch piping.

G. Locate, identify, and protect mechanical and electrical services and distribution extending through renovation or demolition areas, which must maintain operational to serve occupied areas or existing facilities. When existing services and distribution must be interrupted or modified to complete the construction, notify the Owner no less than 72 hours prior to interruption. If services will be interrupted for more than one hour, provide temporary facilities to maintain the occupied areas and facility operations.

H. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

I. Protect enclosures, equipment, and material coatings and finishes from damage and deterioration though the duration of construction.

J. Unless otherwise indicated, mounting heights are to bottom of suspended items and to center of wall mounted items. Where mounting heights are not indicated or dimensioned, install overhead equipment to provide for maximum possible headroom.

K. Arrange for chases, slots, inserts, sleeves, and openings through structure and building components, and in floors, walls, ceilings to allow for electrical installations.

L. Coordinate the installation of required supporting devices and sleeves within poured concrete, masonry work, and other structural components as they are constructed.

M. Coordinate cutting and patching of building components to accommodate the installation of equipment and materials.

N. Install equipment to facilitate maintenance and repair or replacement of equipment components.

O. Install on-grade and floor-mounted electrical service and distribution equipment on concrete pads with suitable anchoring in accordance with Division 03 Sections. Unless noted otherwise, do not extend concrete equipment pads more than 2 inches beyond the equipment footprint.

P. Install equipment and materials level and plumb, as well as parallel and perpendicular to other building systems and components, unless otherwise indicated.

Q. During installation, inspect exposed finish of boxes, conduits, fittings, and other raceways and remove burrs, dirt, and construction debris prior to conductor installation.

R. Repair marred and damaged factory and painted finishes with paint materials and procedures to match original factory or painted finish.

S. Provide and maintain temporary partitions and dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

1.16 CUTTING AND PATCHING

A. Refer to Division 01.

B. Cut, channel, and core drill floors, walls, partitions, ceilings, and other surfaces as required for the electrical installation. Repair and refinish floors, walls, partitions, ceilings, and other surfaces to match adjacent surfaces.
C. Do not alter or damage the installed work of other trades during the processes of cutting and patching. Correct damages to the work of other trades, including repair and replacement necessary to restore their work.

D. Perform cutting, fitting, and patching of equipment and materials at no additional cost to the Owner, and as required to:
   1. Install equipment and materials in new or existing structures.
   2. Provide for installation of ill-timed work.
   3. Remove and replace defective work.
   4. Remove and replace work not in compliance with the Contract Documents.
   5. Remove samples of installed work as specified for testing.
   6. Uncover concealed work that requires review and acceptance by the Architect.

E. Cut, remove, and legally dispose of equipment, fixtures, devices, outlets, conductors, conduit, boxes, materials, and other electrical items made obsolete by the new work.

1.17 FIRESTOPPING
   A. Refer to Division 7.
   B. Apply firestopping materials and installation to electrical penetrations through fire-rated floors, walls, partition, ceilings, and assemblies to restore or maintain the original fire-resistance rating.

1.18 PRODUCT OPTIONS AND SUBSTITUTIONS
   A. Refer to Division 01.
   B. Provide only those manufacturers specified, scheduled, and noted as acceptable for electrical equipment and materials. Where the Contractor or other subcontractors propose alternate designs or product substitutions that are accepted by the Owner, the costs of redesign and construction changes, including the costs incurred by other trades, shall be borne by Contractor.
   C. Equipment and materials of equivalent quality may be substituted for those scheduled or identified by name on the drawings if reviewed by the Architect and accepted by the Owner prior to the bid. Submit proposed substitutions, complete with data necessary to evaluate the proposed substitution to the Architect at least two weeks prior to the bid date.

1.19 EQUIPMENT LIST
   A. Prepare a list of major electrical equipment and long lead items. Transmit to the Architect within two weeks of Contract award.
   B. Electrical equipment and materials shall be manufactured in the U.S. unless otherwise indicated.
   C. When two or more items of same material or equipment are required, they shall be of the same manufacturer. Product manufacturer uniformity does not apply to raw or bulk materials such as conduit, boxes, fittings, fasteners, and similar items, unless otherwise indicated.
   D. Provide products that are compatible with interconnected systems.

1.20 PRODUCT NAMEPLATE DATA
   A. Equipment shall include a proper nameplate and each material unit shall include designations or label indicating manufacturer, product name, model number, serial number, capacity, operating and power characteristics, testing labels, and similar data. Locate equipment and nameplates and labels for ease of visibility.

1.21 EXTRA MATERIALS
   A. Furnish extra products required by other Division 26 Sections. Package products with protective covering for storage and identification label describing the package contents. Deliver extra materials to the Owner and include a copy of transmittal with operation and maintenance manuals.

1.22 COORDINATION DRAWINGS
   A. Refer to Division 01.
B. Prepare and submit coordination drawings as necessary or required by the University showing major elements, components, and systems of equipment and materials in relationship with other building components and systems. Prepare drawings to an accurate scale of 1/4"=1'-0" or larger. Indicate the locations of equipment and materials, code required clearances, and clearances for installation and maintenance. Indicate route and positioning of large equipment into the building during construction.

C. Prepare floor plans, reflected ceiling plans, elevations, sections, and details to fully coordinate and integrate the installation. Indicate locations where space is limited and where sequencing and coordination of installations are of important to efficient work flow including, but not limited to, the following:
1. Electrical equipment room layouts.
2. Specific equipment installations, such as:
   a. Disconnecting means 200 amperes and larger.
   b. Transformers.
   c. Panelboards.
   d. Surge Protective Devices that are external to equipment.
3. Work in chases, trenches, and tunnels.
4. Congested arrangements of conduit, piping, ductwork, or equipment.
5. Routing of interior horizontal and vertical feeder conduits 2 inches and larger.
7. Spare sleeves.

1.23 COMMISSIONING
A. Selected building systems will be commissioned. Commissioning and the commissioning process for electrical equipment and systems are specified in Section {id#1000002}.

B. Provide testing, documentation, and support services for Commissioning of Division 26 systems systems.

1.24 RECORD DOCUMENTS
A. Refer to Division 01.

B. Maintain a complete set of record document drawings at the on-site construction office and keep current for the duration of construction.

C. Mark drawings with revisions to interior and exterior electrical work, including locations, quantities, and sizes of equipment, fixtures, devices, enclosures, conduit, feeders, branch circuits, overcurrent protection, and the like.

D. Mark drawings with revisions resulting from approved Change Orders, Requests for Information (RFI) and Architects Supplemental Instructions (ASI).

E. Mark panelboard schedules, equipment schedules, and similar equipment schedules with installed equipment and materials installed, and any deviations or revisions to the equipment characteristics, capacities, load calculations, and phase load balancing.

F. Incomplete record drawings that do not identify electrical revisions including field conditions, Change Orders, RFIs, ASIs, accepted Substitutions, and the like will not be reviewed and will be returned “Rejected.”

G. Utilize the following color scheme with legible markings:
   1. Red – new items and deviations.
   2. Green – removed or deleted items.

H. At the completion of construction, submit the record documents to the Architect. The Contract will not be considered complete until record drawings have been received and reviewed by the Architect.

1.25 WARRANTIES
A. Refer to Division 01.
B. Refer to individual Division 26 Sections for specific warranty requirements. Warranty duration shall be the longest time period specified in Division 01 or in individual Division 26 Sections, but not less than one year from the date of final acceptance by the Owner.

C. Compile and assemble warranties specified in Division 26 Sections into pertinent operating and maintenance manuals.

D. Provide complete warranty information for each product and equipment specified, including beginning date of warranty or bond, duration of warranty or bond, contact names, addresses, and telephone numbers, and procedures for filing a claim and obtaining warranty services.

1.26 DEMONSTRATION AND TRAINING VIDEOS

A. Refer to Division 01.

B. Provide digital video recordings of demonstration and training required in Division 26 Sections.

C. Engage a qualified videographer to record demonstration and training videos. Record each training module separately. Include classroom sessions and demonstrations, and other visual aids. At the beginning of each module, record a table or chart identifying the learning objectives and lesson outline.

D. Provide high-quality color video recordings with searchable menu navigation in format acceptable to the Owner.

E. Mount camera on a tripod, unless otherwise necessary to show area of demonstration. Display continuous running time.

F. Include audio narration for video recordings describing systems and items viewed; the location, room name, or room number; and the vantage point. Confirm narration is audible.

1.27 OPERATION AND MAINTENANCE DATA

A. Refer to Division 01.

B. Four weeks prior to the completion of construction, prepare two hard-copy sets of operation and maintenance manuals as specified in Division 01 and Division 26 Sections. After operating and maintenance manuals have been reviewed by the Architect, submit hard-copies of manuals and a scanned copy in searchable, portable data file (.pdf) format within two weeks of receipt of Architect’s review comments.

C. Compile and assemble operation and maintenance manuals into labeled and tabulated three ring binders. Include project name and address, general description of contents, as well as name and contact information for the Contractor and subcontractors on the front cover of binders. Include project name and general description on the binder spines.

D. In addition to the information specified in Division 26 Sections, include the following:
   1. Equipment description, function, characteristics, limitations, and warnings.
   2. Normal and emergency operating procedures.
   3. Instructions for start-up, control, shut-down, and summer/winter operations.
   4. Routine and preventative maintenance procedures and schedules.
   5. Instructions for assembly, repair, adjustments, and troubleshooting.
   6. Wiring diagrams and fuse curves.
   7. Service instruction manuals.
   8. Engineering data and source quality control test reports.
   9. Name, address, and telephone for 24-hour service.
   10. Complete parts list.
   11. Extra materials list.
   12. Warranties.
   13. Signed field observation and test reports.
   14. Demonstration and training videos.

1.28 CLEANING

A. Refer to Division 01.
B. Clean luminaires, lenses, louvers, reflectors, and other lighting components prior to final acceptance.

END OF SECTION 260100
SECTION 260505
ELECTRICAL DEMOLITION AND ALTERATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Electrical demolition and alternations.

1.02 RELATED REQUIREMENTS
   A. Section 260100 - Basic Electrical Requirements: Additional requirements for system upgrades, system modifications, and system replacements.

1.03 DEFINITIONS
   A. Grayed or Light Line Weight and Text on Drawings: Existing to remain, unless otherwise indicated.
   B. Bold or Heavy Line Weight and Text on Drawings: Alterations and new work, unless otherwise indicated.
   C. Bold "XXX" and Hatch Lines on Drawings: Existing to be removed.
   D. (D) on Drawings: Demolish and remove.
   E. (E) on Drawings: Existing to remain.
   F. (R) on Drawings: New location for existing item to be relocated.
   G. (RR) on Drawings: Existing location for existing item to be relocated.

1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Sustainable Design Documentation: Submit certification of removal and appropriate disposal of abandoned cables containing lead stabilizers.
   C. Method of Procedure: Electrical outages.
   D. Equipment and Materials List: Stored items for relocation.

PART 2 PRODUCTS

2.01 EQUIPMENT AND MATERIALS
   A. Provide equipment, materials, and labor necessary for the complete removal, alteration, or relocation of systems, equipment, and components indicated.
   B. Modify equipment as indicated on the drawings and as specified in individual sections.
      1. Provide parts and assemblies compatible with existing equipment and approved for use by the original manufacturer.
      2. Maintain equipment Underwriters Laboratories (UL) Listing. Do not modify equipment in such a manner that would void the UL certification or listing.
      3. Provide existing equipment information to fabricator and supplier including original manufacturer, model, serial number, date of manufacturer, and requirements.
   C. Materials and equipment for patching and extending work: As specified in individual sections.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Report discovery of Asbestos Containing Materials (ACM) to the Architect when discovered.
   B. Verify actual circuiting arrangements where existing circuit numbers are indicated.
   C. Verify that wiring and equipment to be demolished serve only abandoned facilities.
   D. Existing equipment and material locations identified on the drawings are based on casual field observation and existing drawings, of unknown accuracy. Verify existing field conditions and allow for minor adjustments.
   E. Report major discrepancies to Owner before disturbing existing installation.

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Electrical Demolition and Alterations
F. Report major discrepancies to Architect before disturbing existing installation.
G. Reuse existing raceways, equipment, fixtures, outlets, devices, and other electrical items only as indicated or specified. Inspect condition for reuse and report unsuitable items to Architect.
H. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION
A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
B. Disconnect electrical systems from equipment, fixtures, outlets, devices, and components to be removed or relocated.
C. Coordinate utility service outages with Campus Utilities.
D. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
E. Existing Electrical Service: Maintain existing system in service during construction. Disable system only to make switchovers and connections. Minimize outage duration.
   1. Obtain permission from Owner at least two weeks before partially or completely disabling system.
   2. Make temporary connections to maintain service in areas adjacent to work area.
   3. Prepare and submit a Method of Procedure (MOP) for each required electrical outage to the Architect two weeks prior to an outage. Include date, time, anticipated maximum outage duration, reason for outage, areas affected, sequence of procedures, and related details. In addition, provide the duration of each task.
F. Existing Fire Alarm System: Maintain existing system in service. Minimize outage duration.
   1. Notify Owner before partially or completely disabling system.
   2. Notify local fire service.
   3. Make notifications at least two weeks in advance.
   4. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND ALTERATION OF EXISTING ELECTRICAL WORK
A. Perform removal and disposal of equipment and materials in accordance with applicable federal, state, and local regulations.
B. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations.
C. Where equipment and materials are reused or kept for the Owner, remove and store until reinstallation or until the Owner requests possession.
   1. Prepare and submit a written list of equipment and materials prior to storage.
   2. Wrap and tag items to correspond with written storage list.
   3. Protect from theft and damage.
D. Remove, relocate, and extend existing installations to accommodate new construction.
E. Remove all abandoned wiring to source of supply, or to the last outlet or device unaffected by the work.
F. Remove exposed abandoned conduit, including abandoned conduit above accessible ceilings in its entirety back to its source.
   1. Cut conduit a minimum of 2 inch (50 mm) back from the concealing surface, repair and patch surface.
   2. Cut conduit flush with concrete surfaces, seal and patch conduit opening.
   3. Remove conduit exposed by demolition and alteration work in its entirety back to its source.
   4. Concealed conduit unexposed by demolition and alteration work may be abandoned in place.
G. Disconnect and remove abandoned panelboards and distribution equipment.

H. Disconnect and remove electrical devices and equipment serving utilization equipment that has been abandoned.

I. Repair adjacent construction and finishes damaged during demolition and extension work.

J. Replace equipment and materials damaged during demolition and alteration work.

K. Replace equipment and materials damaged during removal, storage, relocation, and reinstallation work.

L. Replace in-floor and underfloor raceways and conductors damaged or altered as a result of floor cutting and coring.

M. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.

N. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

O. Extend branch circuits with matching raceways and conductors unless indicated otherwise. Splicing of feeders and homerun branch circuits to motors is not allowed; provide new conductors from source to load.
   1. Where existing conductors are to be utilized and extended, the existing circuitry shall be tested for conductor and insulation integrity prior to reuse.

P. Provide temporary support of existing equipment, fixtures, and other electrical components where the work includes replacement of ceilings or temporary removal of ceilings. Reinstall equipment, fixtures, and other electrical components after completion of ceiling replacements and alterations.

Q. Provide tie bars on circuit breaker handles where the work includes alterations to existing branch circuits with a common neutral conductor and more than one phase phase conductor. Tie bars on circuit breaker handles are only allowed for existing circuits with a shared neutral conductor.

3.04 CLEANING AND REPAIR

A. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

B. Clean and repair existing materials and equipment that remain or that are to be reused.

C. Enclosures: Vacuum clean interiors of distribution equipment and boxes.

D. Distribution Equipment: Use mild detergent to clean exposed surfaces.
   1. Replace fuses.
   2. Replace damaged circuit breakers.
   3. Check tightness of electrical connections.
   4. Provide closure plates for conduit openings and vacant device positions.
   5. Provide new typed circuit directory for revised panelboards.
   6. Provide new identification nameplates for renamed equipment and revised circuits.

E. Luminaires: Use mild detergent to clean exterior and interior surfaces; rinse with clean water and wipe dry.

END OF SECTION 260505
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SECTION 260519
LOW-VOLTAGE ELECTRICAL CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single conductor building wire.
B. Wiring connectors.
C. Electrical tape.
D. Heat shrink tubing.
E. Oxide inhibiting compound.
F. Wire pulling lubricant.
G. Cable ties.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 260505 - Electrical Demolition and Alterations: Disconnection, removal, and/or extension of existing electrical conductors and cables.
C. Section 260526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
D. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
E. Section 260800 - Electrical Commissioning Requirements: Additional requirements for Commissioning.

1.03 REFERENCE STANDARDS

F. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
I. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
O. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape Current Edition, Including All Revisions.

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Low-Voltage Electrical Conductors
and Cables
1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
   3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.
C. Field Quality Control Test Reports.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
E. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.

1.06 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F (-10 degrees C), unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
C. Armored cable is not permitted.
D. Nonmetallic-sheathed cable, service entrance cable, underground feeder cable, and branch-circuit cable are not permitted.
E. Metal-clad cable is not permitted.
F. Manufactured wiring systems are not permitted.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductors for Grounding and Bonding: Also comply with Section 260526.

H. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.

I. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
      a. Exceptions:
         1) 20 A, 120 V circuits longer than 75 feet (23 m): 10 AWG, for voltage drop.
         2) 20 A, 120 V circuits longer than 150 feet (46 m): 8 AWG, for voltage drop.
         3) 20 A, 277 V circuits longer than 150 feet (46 m): 10 AWG, for voltage drop.
      2. Control Circuits: 14 AWG.

J. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

K. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
      a. Conductors size 8 AWG and larger may have black insulation color coded using vinyl color coding electrical tape with the exception of grounding conductors which shall be integrally-colored insulation for all sizes.
   3. Color Code:
      a. 480Y/277 V, 3 Phase, 4 Wire System:
         1) Phase A: Brown.
         2) Phase B: Orange.
         3) Phase C: Yellow.
         4) Neutral/Grounded: Gray.
      b. 208Y/120 V, 3 Phase, 4 Wire System:
         1) Phase A: Black.
         2) Phase B: Red.
         3) Phase C: Blue.
         4) Neutral/Grounded: White.
      d. Travelers for 3-Way and 4-Way Switching: Pink.
      e. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.
      f. For control circuits, comply with manufacturer's recommended color code.

2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:
   1. Copper Building Wire:
e. Triangle Wire & Cable Co.
f. American Wire and Cable Co.
g. Belden; Cooper Industries

B. Description: Single conductor insulated wire.

C. Conductor Stranding:
1. Feeders and Branch Circuits:
   b. Size 8 AWG and Larger: Stranded.
2. Control Circuits: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation:
1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
   a. Size 250 MCM and Larger: Type THW or THWN.
   b. In sizes #1 AWG and smaller all conductors shall have heat/moisture resistant
      thermoplastic insulation type THW or THWN (75 degree C), except as follows:
      1) Where conduit temperature will exceed 100 degree F, use type THHN (90
      degree C) Type XHHW (90 degree C) permissible in dry locations.

2.04 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the
   conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as
   applicable.

B. Connectors for Grounding and Bonding: Comply with Section 260526.

C. Wiring Connectors for Splices and Taps:
1. Copper Conductors Size 8 AWG and Smaller: Use insulated pressure type (with live
   spring) rated 105 degree C, 600 volt, for building wiring and 1000 volt in signs or fixtures.
   3M or Ideal.
2. Copper Conductors Size 6 AWG and Larger: Use For wires size #6 AWG and larger, T &
   B or equivalent compression type with 3M #33 or #88 tape insulation.

D. Wiring Connectors for Terminations:
1. Provide terminal lugs for connecting conductors to equipment furnished with terminations
   designed for terminal lugs.
2. Where over-sized conductors are larger than the equipment terminations can
   accommodate, provide connectors suitable for reducing to appropriate size, but not less
   than required for the rating of the overcurrent protective device.
3. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression
   connectors for all connections.
4. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections
   to terminal screws.
5. Connectors for Control Circuits: Use crimped terminals for all connections.

E. Do not use insulation-piercing or insulation-displacement connectors designed for use with
   conductors without stripping insulation.

F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.

G. Mechanical Connectors: Provide bolted type.
1. Manufacturers:
   d. O-Z/Gedney Co.
   e. Amp, Inc.
f. Ideal Industries, Inc.
g. 3M Company

H. Compression Connectors: Provide circumferential type crimp configuration.
   1. Manufacturers:
      d. O-Z Gedney Co.
      e. Amp Inc.
      f. Ideal Industries, Inc.
      g. 3M Company

I. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.
   1. Manufacturers:
      d. O-Z Gedney Co.
      e. Amp Inc.
      f. Ideal Industries, Inc.
      g. 3M Company

2.05 WIRING ACCESSORIES

A. Cable Supports: Assembly consisting of threaded malleable iron body and insulating wedging plug or plugs suitable for the size and quantity of individual conductors within vertical riser conduits.

B. Electrical Tape:
   1. Manufacturers:
      a. 3M: www.3m.com/#sle.
   2. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
   3. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).

C. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
   1. Manufacturers:
      a. 3M: www.3m.com/#sle.

D. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.
   1. Manufacturers:

E. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
   1. Manufacturers:
a. 3M: www.3m.com/#sle.

F. Cable Ties: Self-extinguishing, one-piece, self-locking, type 6/6 nylon; suitable for application.
   1. Minimum Width: 3/16 inch (5 mm).
   2. Tensile Strength: 50 pounds, minimum.
   3. Temperature Range: Minus 40 and 185 degrees F (minus 40 and 85 degrees C).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.
B. Verify that work likely to damage wire and cable has been completed.
C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.
3.03 INSTALLATION

A. Circuiting Requirements:
   1. Unless dimensioned, circuit routing indicated is diagrammatic.
   2. When circuit destination is indicated without specific routing, determine exact routing required.
   3. Arrange circuiting to minimize splices.
   4. Include circuit lengths required to install connected devices within 10 ft (3.0 m) of location indicated.
   5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
      a. Provide raceways for Class 1 circuits.
   6. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
   7. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are shown as separate, combining them together in a single raceway is permitted for 15 ampere and 20 ampere (maximum) branch circuits, under the following conditions:
      a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
      b. Increase size of conductors as required to account for ampacity derating.
      c. Size raceways, boxes, etc. to accommodate conductors.
   8. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Installation in Raceway:
   1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
   2. Pull all conductors and cables together into raceway at same time.
   3. Do not damage conductors and cables or exceed manufacturer’s recommended maximum pulling tension and sidewall pressure.
   4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

E. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

F. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
   1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.

G. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.

H. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet (1.5 m) of slack.

I. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

J. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

K. Make wiring connections using specified wiring connectors.

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Low-Voltage Electrical Conductors and Cables
1. Make branch circuit splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
3. Do not remove conductor strands to facilitate insertion into connector.
4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

L. Splicing of all feeders is prohibited. Feeders shall be continuous from source to load connection.

M. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
   1. Dry Locations: Use insulating covers specifically designed for the connectors or heat shrink tubing.
   2. Damp Locations: Use heat shrink tubing.

N. Insulate ends of spare conductors using vinyl insulating electrical tape.

O. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

P. Identify conductors and cables in accordance with Section 260553.

Q. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

R. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. See Section 260800 - Electrical Commissioning Requirements, for additional requirements.

C. Inspect and test in accordance with NETA ATS, except Section 4.

D. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is only required for services and feeders. The resistance test for parallel conductors listed as optional is required.
   1. Disconnect surge protective devices (SPDs) prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPDs connected.

E. Correct deficiencies and replace damaged or defective conductors and cables.

F. Submit detailed reports indicating inspection and testing results and corrective actions taken.

END OF SECTION 260519
SECTION 260526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Grounding and bonding requirements.
B. Conductors for grounding and bonding.
C. Connectors for grounding and bonding.
D. Ground bars.
E. Ground rod electrodes.

1.02 RELATED REQUIREMENTS
A. Section 260519 - Low-Voltage Electrical Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
   1. Includes oxide inhibiting compound.
B. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
C. Section 260800 - Electrical Commissioning Requirements: Additional requirements for Commissioning.

1.03 REFERENCE STANDARDS
B. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings 2022.
E. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Verify exact locations of underground metal water service pipe entrances to building.
   2. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not install ground rod electrodes until final backfill and compaction is complete.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements for submittals procedures.
B. Product Data: Provide manufacturer’s standard catalog pages and data sheets for grounding and bonding system components.

C. Field quality control test reports.

D. Project Record Documents: Record actual locations of grounding electrode system components and connections.

1.06 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer’s instructions.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.

B. Do not use products for applications other than as permitted by NFPA 70 and product listing.

C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

E. Grounding System Resistance:
   1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.
   2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.

F. Grounding Electrode System:
   1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
      a. Provide continuous grounding electrode conductors without splice or joint.
      b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
   2. Metal Underground Water Pipe(s):
      a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet (3.0 m) at an accessible location not more than 5 feet (1.5 m) from the point of entrance to the building.
      b. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.
      c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
   3. Metal In-Ground Support Structure:
      a. Provide connection to metal in-ground support structure that is in direct contact with earth in accordance with NFPA 70.
4. Ground Rod Electrode(s):
   a. Provide three electrodes in an equilateral triangle configuration unless otherwise indicated or required.
   b. Space electrodes not less than 10 feet (3.0 m) from each other and any other ground electrode.
   c. Where location is not indicated, locate electrode(s) at least 5 feet (1.5 m) outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
   d. Provide ground access well for electrodes in hardscape areas.
5. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.
6. Ground Bar: Provide ground bar, separate from service equipment enclosure, for common connection point of grounding electrode system bonding jumpers as permitted in NFPA 70. Connect grounding electrode conductor provided for service-supplied system grounding to this ground bar.
   a. Ground Bar Size: 1/4 by 4 by 24 inches (6 by 100 by 610mm) minimum unless otherwise indicated or required.
   b. Where ground bar location is not indicated, locate in accessible location as near as possible to service disconnect enclosure.
   c. Ground Bar Mounting Height: 24 inches (610 mm) above finished floor unless otherwise indicated.
7. Ground Riser: Provide common grounding electrode conductor not less than 3/0 AWG for tap connections to multiple separately derived systems as permitted in NFPA 70.

G. Service-Supplied System Grounding:
   1. For each service disconnect, provide grounding electrode conductor to connect neutral (grounded) service conductor to grounding electrode system. Unless otherwise indicated, make connection at neutral (grounded) bus in service disconnect enclosure.
   2. For each service disconnect, provide main bonding jumper to connect neutral (grounded) bus to equipment ground bus where not factory-installed. Do not make any other connections between neutral (grounded) conductors and ground on load side of service disconnect.

H. Separately Derived System Grounding:
   1. Separately derived systems include, but are not limited to:
      a. Transformers (except autotransformers such as buck-boost transformers).
      2. Provide grounding electrode conductor to connect derived system grounded conductor to nearest ground bar. Do not connect derived systems to communications systems ground bars. Unless otherwise indicated, make connection at neutral (grounded) bus in first disconnecting means.
   3. Provide bonding jumper to connect derived system grounded conductor to nearest metal building frame and nearest metal water piping in the area served by the derived system, where not already used as a grounding electrode for the derived system. Make connection at same location as grounding electrode conductor connection.
   4. Where common grounding electrode conductor ground riser is used for tap connections to multiple separately derived systems, provide bonding jumper to connect the metal building frame and metal water piping in the area served by the derived system to the common grounding electrode conductor.
   5. Provide system bonding jumper to connect system grounded conductor to equipment ground bus. Make connection at same location as grounding electrode conductor connection. Do not make any other connections between neutral (grounded) conductors and ground on load side of separately derived system disconnect.
   6. Where the source and first disconnecting means are in separate enclosures, provide supply-side bonding jumper between source and first disconnecting means.

I. Bonding and Equipment Grounding:
   1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and
other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.

2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.

3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.

4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.

6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:
   a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.

8. Provide bonding for metal building frame.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:
   1. Use insulated copper conductors unless otherwise indicated.
   2. Conductor Stranding:
      a. Size 8 AWG and Smaller: Solid.
      b. Size 6 AWG and Larger: Stranded.
   3. Factory Pre-fabricated Bonding Jumpers: Furnished with factory-installed ferrules; size braided cables to provide equivalent gage of specified conductors.

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors for accessible connections.
      a. Exceptions:
         1) Use exothermic welded connections for bonding to structural steel.
         2) Use bolted ground clamp for bonding to metal piping.
         3) Use two-hole long barrel irreversible compression connectors with inspection windows for ground bar terminations.
   4. Manufacturers - Mechanical and Compression Connectors:
   5. Manufacturers - Exothermic Welded Connections:
      c. thermOweld, subsidiary of Continental Industries; division of Burndy LLC: www.thermoweld.com.

D. Ground Bars:
   1. Description: Copper rectangular ground bars with mounting brackets and insulators.
   2. Size: As indicated.
   3. Holes for Connections: As indicated or as required for connections to be made.
4. Terminations: Use antioxidant for ground bar terminations.
5. Manufacturers:
   c. thermOwed, subsidiary of Continental Industries; division of Burndy LLC: www.thermalcom.

E. Ground Rod Electrodes:
   1. Comply with NEMA GR 1.
   3. Size: 3/4 inch (19 mm) diameter by 10 feet (3.0 m) length, unless otherwise indicated.
   4. Manufacturers:

F. Oxide Inhibiting Compound: Comply with Section 260519.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that work likely to damage grounding and bonding system components has been completed.
   B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Install products in accordance with manufacturer's instructions.
   B. Perform work in accordance with NECA 1 (general workmanship).
   C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70.
      1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches (150 mm) below finished grade.
   D. Make grounding and bonding connections using specified connectors,
      1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
      2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
      3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
      4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
      5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
   E. Identify grounding and bonding system components in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. See Section 260800 - Electrical Commissioning Requirements, for additional requirements.
   C. Inspect and test in accordance with NETA ATS except Section 4.
   D. Perform inspections and tests listed in NETA ATS, Section 7.13.
E. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous two weeks does not constitute normally dry conditions.

F. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

G. Submit detailed reports indicating inspection and testing results and corrective actions taken.

END OF SECTION 260526
SECTION 260529
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Support and attachment components for equipment, conduit, cable, boxes, and other electrical work.

1.02  RELATED REQUIREMENTS
A. Section 033000 - Cast-in-Place Concrete: Concrete equipment pads.
B. Section 055000 - Metal Fabrications: Materials and requirements for fabricated metal supports.
C. Section 260533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
D. Section 260533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.

1.03  REFERENCE STANDARDS
D. MFMA-4 - Metal Framing Standards Publication 2004.
E. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04  ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
   2. Coordinate the work with other trades to provide additional framing and materials required for installation.
   3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
   4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 033000.

1.05  SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems and post-installed concrete and masonry anchors.
C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
1.06 QUALITY ASSURANCE
   A. Comply with NFPA 70.
   B. Comply with applicable building code.
   C. Installer Qualifications for Field-Welding: As specified in Section 055000.
   D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS
   A. General Requirements:
      1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
      2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
      3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
      4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
      5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
         a. Indoor Dry Locations: Use zinc-plated steel unless otherwise indicated.
         b. Outdoor and Damp or Wet Indoor Locations: Use stainless steel unless otherwise indicated.
         c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
         d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
   B. Materials for Metal Fabricated Supports: Comply with Section 055000.
   C. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
      1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
         a. One-Hole Conduit Straps or Minerallac: For supporting 3/4 inch and smaller conduit, galvanized steel.
         b. Two-Hole Conduit Straps or Minerallac or industry approved equal: For supporting 1 inch and larger conduit, galvanized steel; 3/4 inch strap width; and 2-1/8 inch between center of screw holes.
      2. Conduit Clamps: Bolted type unless otherwise indicated.
      3. Manufacturers:
   D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
2. Channel Material:
   a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
   b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
3. Minimum Channel Thickness: Steel sheet, 12 gage, 0.1046 inch (2.66 mm).
4. Minimum Channel Dimensions: 1-5/8 inch (41 mm) width by 13/16 inch (21 mm) height.
5. Manufacturers:
E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
   1. Minimum Size, Unless Otherwise Indicated or Required:
      a. Equipment Supports: 1/2 inch (13 mm) diameter.
      b. Single Conduit up to 1 inch (27 mm) trade size: 1/4 inch (6 mm) diameter.
      c. Single Conduit larger than 1 inch (27 mm) trade size: 3/8 inch (10 mm) diameter.
      d. Trapeze Support for Multiple Conduits: 3/8 inch (10 mm) diameter.
F. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
   2. Concrete: Use preset concrete inserts or expansion anchors.
   3. Solid or Grout-Filled Masonry: Use expansion anchors.
   6. Steel: Use beam clamps, machine bolts, or welded threaded studs.
   7. Sheet Metal: Use sheet metal screws.
   8. Wood: Use wood screws.
   9. Plastic, fiber, and lead anchors are not permitted.
   10. Powder-actuated fasteners are not permitted.
   11. Hammer-driven anchors and fasteners are not permitted.
   12. Post-Installed Concrete and Masonry Anchors: Evaluated and recognized by ICC Evaluation Service, LLC (ICC-ES) for compliance with applicable building code.
   13. Manufacturers - Mechanical Anchors:

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that mounting surfaces are ready to receive support and attachment components.
   B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Install products in accordance with manufacturer's instructions.
   B. Perform work in accordance with NECA 1 (general workmanship).
   C. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
   D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
   E. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
   F. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
G. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

H. Equipment Support and Attachment:
   1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
   2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls.
   3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
   4. Unless otherwise indicated, mount floor-mounted equipment on properly sized 4 inch (100 mm) high concrete pad constructed in accordance with Section 033000.
   5. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

I. Conduit Support and Attachment: Also comply with Section 260533.13.
   1. Provide space on metal channel (strut) for 25 percent additional future conduit.

J. Box Support and Attachment: Also comply with Section 260533.16.

K. Secure fasteners according to manufacturer's recommended torque settings.

L. Remove temporary supports.

3.03 FIELD QUALITY CONTROL
A. See Section 014000 - Quality Requirements, for additional requirements.
B. Inspect support and attachment components for damage and defects.
C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION 260529
SECTION 260533.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Galvanized steel rigid metal conduit (RMC).
   B. Intermediate metal conduit (IMC).
   C. PVC-coated galvanized steel rigid metal conduit (RMC).
   D. Flexible metal conduit (FMC).
   E. Liquidtight flexible metal conduit (LFMC).
   F. Electrical metallic tubing (EMT).
   G. Conduit fittings.
   H. Accessories.

1.02 RELATED REQUIREMENTS
   A. Section 033000 - Cast-in-Place Concrete: Concrete encasement of conduits.
   B. Section 078400 - Firestopping.
   C. Section 260519 - Low-Voltage Electrical Conductors and Cables.
   D. Section 260526 - Grounding and Bonding for Electrical Systems.
      1. Includes additional requirements for fittings for grounding and bonding.
   E. Section 260529 - Hangers and Supports for Electrical Systems.
   F. Section 260533.16 - Boxes for Electrical Systems.
   G. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS
   D. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
   F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.
   G. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   H. UL 1 - Flexible Metal Conduit Current Edition, Including All Revisions.
   I. UL 6 - Electrical Rigid Metal Conduit-Steel Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
      2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
4. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:
1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements for submittals procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.
C. Shop Drawings:
   1. Include proposed locations of roof and wall penetrations and proposed methods for sealing.
D. Project Record Documents: Record actual routing for conduits 2 inch (53 mm) trade size and larger.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS
2.01 CONDUIT APPLICATIONS
A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
C. Concealed Within Masonry Walls: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
D. Concealed Within Hollow Stud Walls: Use electrical metallic tubing (EMT).
E. Concealed Above Accessible Ceilings: Use electrical metallic tubing (EMT).
F. Interior Damp Locations: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
G. Interior Wet Locations: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
H. Exposed, Interior, Not Subject to Physical Damage: Use electrical metallic tubing (EMT).
I. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
   1. Locations subject to physical damage include, but are not limited to:
      a. Where exposed between finished floor and 8 feet (2.4 m) above finished floor in mechanical rooms, vehicular parking areas, service corridors, loading dock, and loading and unloading areas.
      b. Where exposed between finished floor and 20 feet (6.1 m) above finished floor in loading and unloading areas and shipping and receiving areas.
J. Connections to Vibrating Equipment:
   1. Dry Locations: Use flexible metal conduit.
2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
3. Maximum Length: 6 feet (1.8 m) unless otherwise indicated.
4. Vibrating equipment includes, but is not limited to:
   a. Transformers.
   b. Motors.

2.02 CONDUIT REQUIREMENTS
   A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.
   B. Fittings for Grounding and Bonding: Also comply with Section 260526.
   C. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
   D. Provide products listed, classified, and labeled as suitable for the purpose intended.
   E. Minimum Conduit Size, Unless Otherwise Indicated:
      1. Branch Circuits: 3/4 inch (21 mm) trade size.
      2. Branch Circuit Homers: 3/4 inch (21 mm) trade size.
      3. Control Circuits: 3/4 inch (21 mm) trade size.
   F. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)
   A. Manufacturers:
      3. Carlon
   B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
   C. Fittings:
      1. Manufacturers:
         c. RACO
         d. Appleton
      2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
         a. Do not use die cast zinc fittings.
      4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 INTERMEDIATE METAL CONDUIT (IMC)
   A. Manufacturers:
      3. Carlon
   B. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.
   C. Fittings:
      1. Manufacturers:
         c. RACO
         d. Appleton
2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

   a. Do not use die cast zinc fittings.

4. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.05 FLEXIBLE METAL CONDUIT (FMC)

A. Manufacturers:

B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

C. Fittings:
   1. Manufacturers:
      c. RACO
      d. Appleton
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
      a. Do not use die cast zinc fittings.

2.06 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Manufacturers:

B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

C. Fittings:
   1. Manufacturers:
      c. RACO
      d. Appleton
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
      a. Do not use die cast zinc fittings.

2.07 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
   3. Carlon

B. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

C. Fittings:
   1. Manufacturers:
c. RACO

d. Appleton

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.

   a. Do not use die cast zinc fittings.

4. Connectors and Couplings: Use compression (gland) or set-screw type.
   a. Do not use indenter type connectors and couplings.

5. Damp or Wet Locations (where permitted): Use fittings listed for use in wet locations.

6. Embedded Within Concrete (where permitted): Use fittings listed as concrete-tight. Fittings that require taping to be concrete-tight are not acceptable.

2.08 ACCESSORIES
   A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil (0.51 mm).
   B. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.
   C. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force (890 N).
   D. Sealing Compound for Sealing Fittings: Listed for use with the particular fittings to be installed.
   E. Modular Seals for Conduit Penetrations: Rated for minimum of 40 psig; Suitable for the conduits to be installed.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that mounting surfaces are ready to receive conduits.
   B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Install products in accordance with manufacturer's instructions.
   B. Perform work in accordance with NECA 1 (general workmanship).
   C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
   D. Install intermediate metal conduit (IMC) in accordance with NECA 101.
   E. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer.

F. Conduit Routing:
   1. Conduit routing indicated is diagrammatic.
   2. When conduit destination is indicated without specific routing, determine exact routing required.
   3. Conceal all conduits unless specifically indicated to be exposed.
   4. Conduits in the following areas may be exposed, unless otherwise indicated:
      a. Electrical rooms.
      b. Mechanical equipment rooms.
      c. Within joists in unareas with no ceiling.
   5. Unless otherwise approved, do not route conduits exposed:
      a. Across floors.
      b. Across roofs.
      c. Across top of parapet walls.
      d. Across building exterior surfaces.
   6. Arrange conduit to maintain adequate headroom, clearances, and access.
   7. For conduits 1 inch (27 mm) trade size and smaller, arrange conduit to provide no more than the equivalent of three 90 degree bends between pull points.
8. For conduits larger than 1 inch (27 mm) trade size, arrange conduit to provide no more than the equivalent of three 90 degree bends between pull points.
9. Arrange conduit to provide no more than 100 feet (30m) between pull points.
10. Route conduits above water and drain piping where possible.
11. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
12. Maintain minimum clearance of 6 inches (150 mm) between conduits and piping for other systems.
13. Maintain minimum clearance of 12 inches (300 mm) between conduits and hot surfaces. This includes, but is not limited to:
   a. Heaters.
   b. Hot water piping.
   c. Flues.
14. Group parallel conduits in the same area together on a common rack.

G. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
4. Use conduit strap to support single surface-mounted conduit.
   a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
7. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
8. Use of spring steel conduit clips for support of conduits is permitted only as follows:
   a. Support of electrical metallic tubing (EMT) and flexible metal conduit (FMC) up to 1 inch (27 mm) trade size concealed above accessible ceilings and within hollow stud walls.
9. Use of wire for support of conduits is not permitted.
10. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with the most stringent requirements.

H. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
7. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
8. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

I. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and
grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set
sleeves flush with exposed surfaces unless otherwise indicated or required.
4. Conceal bends for conduit risers emerging above ground.
5. Seal interior of conduits entering the building from underground at first accessible point to
prevent entry of moisture and gases.
6. Provide suitable modular seal where conduits penetrate exterior wall below grade.
7. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of
membrane.
8. Make penetrations for roof-mounted equipment within associated equipment openings and
curbs where possible to minimize roofing system penetrations. Where penetrations are
necessary, seal as indicated or as required to preserve integrity of roofing system and
maintain roof warranty. Include proposed locations of penetrations and methods for
sealing with submittals.
9. Provide metal escutcheon plates for conduit penetrations exposed to public view.
10. Install firestopping to preserve fire resistance rating of partitions and other elements, using
materials and methods specified in Section 078400.

J. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion
and expansion/deflection fittings to prevent damage to enclosed conductors or connected
equipment. This includes, but is not limited to:
   1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
   2. Where conduits are subject to earth movement by settlement or frost.

K. Condensation Prevention: Where conduits cross barriers between areas of potential
substantial temperature differential, provide sealing fitting or approved sealing compound at an
accessible point near the penetration to prevent condensation. This includes, but is not limited to:
   1. Where conduits pass from outdoors into conditioned interior spaces.
   2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

L. Provide pull string in all empty conduits and in conduits where conductors and cables are to be
installed by others. Leave minimum slack of 12 inches (300 mm) at each end.

M. Provide grounding and bonding in accordance with Section 260526.

N. Identify conduits in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL
A. See Section 014000 - Quality Requirements, for additional requirements.
B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by
manufacturer. Replace components that exhibit signs of corrosion.
C. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or
abrasions, repair in accordance with manufacturer's instructions.
D. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING
A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION
A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection
from entry of moisture and foreign material and do not remove until ready for installation of
conductors.

END OF SECTION 260533.13
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SECTION 260533.16
BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches (1,650 cu cm), including those used as junction and pull boxes.

B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches (1,650 cu cm).

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.

B. Section 083100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.

C. Section 260529 - Hangers and Supports for Electrical Systems.

D. Section 260533.13 - Conduit for Electrical Systems:
   1. Conduit bodies and other fittings.
   2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.

E. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.


C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable 2014.

D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports 2013 (Reaffirmed 2020).


F. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.


1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
   4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
   5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
   6. Coordinate the work with other trades to preserve insulation integrity.
7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
8. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for cabinets and enclosures and underground boxes/enclosures.
C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Keys for Lockable Enclosures: Six of each different key.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS
2.01 BOXES
A. General Requirements:
   1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
   2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
   3. Provide products listed, classified, and labeled as suitable for the purpose intended.
   4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
   5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
B. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used as Junction and Pull Boxes:
   1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
   2. Use cast iron boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
   3. Use suitable concrete type boxes where flush-mounted in concrete.
   4. Use suitable masonry type boxes where flush-mounted in masonry walls.
   5. Use raised covers suitable for the type of wall construction and device configuration where required.
   6. Use shallow boxes where required by the type of wall construction.
   7. Do not use "through-wall" boxes designed for access from both sides of wall.
   8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
   9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
   11. Manufacturers:

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
   1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
   2. NEMA 250 Environment Type, Unless Otherwise Indicated:
      a. Indoor Clean, Dry Locations: Type 1, painted steel.
      b. Outdoor Locations: Type 3R, painted steel.
   3. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
      a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
   4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
      a. Provide lockable hinged covers, all locks keyed alike unless otherwise indicated.
   5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.
   6. Manufacturers:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that mounting surfaces are ready to receive boxes.

B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide separate boxes for emergency power and normal power systems.

E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.

F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.

G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.

H. Box Locations:
   1. Locate boxes to be accessible. Provide access panels in accordance with Section 083100 as required where approved by the Architect.
      a. Access panel having a hinged metal door neatly fitted into a flush metal trim, where a J-box or equipment is located above non-accessible ceilings or behind finished walls.
      b. Coordinate location and type with the University Project Manager.
      c. Access panels shall be minimum 24”x24” or 6” larger than pull box.
   2. Box locations indicated are approximate.
   3. Locate boxes as required for devices installed under other sections or by others.
   4. Locate boxes so that wall plates do not span different building finishes.
   5. Locate boxes so that wall plates do not cross masonry joints.
   6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
   7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 12 inches (300 mm) horizontal separation unless otherwise indicated.
8. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches (610 mm) horizontal separation.

9. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
   a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches (610 mm) separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.

10. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 260533.13.

I. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
   3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.
   4. Use stud-to-stud supports to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.

J. Install boxes plumb and level.

K. Flush-Mounted Boxes:
   1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch (6 mm) or does not project beyond finished surface.
   2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
   3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch (3 mm) at the edge of the box.

L. Install boxes as required to preserve insulation integrity.

M. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

N. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

O. Close unused box openings.

P. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

Q. Provide grounding and bonding in accordance with Section 260526.

R. Identify boxes in accordance with Section 260553.

3.03 CLEANING
   A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.04 PROTECTION
   A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION 260533.16
SECTION 260553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Electrical identification requirements.
   B. Identification nameplates and labels.
   C. Wire and cable markers.
   D. Floor marking tape.
   E. Warning signs and labels.

1.02  RELATED REQUIREMENTS
   A. Section 099123 - Interior Painting.
   B. Section 260519 - Low-Voltage Electrical Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.
   C. Section 262726 - Wiring Devices: Device and wallplate finishes; factory pre-marked wallplates.

1.03  REFERENCE STANDARDS
   C. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   D. NFPA 70E - Standard for Electrical Safety in the Workplace 2024.

1.04  ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
   B. Sequencing:
      1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
      2. Do not install identification products until final surface finishes and painting are complete.

1.05  SUBMITTALS
   A. See Section 013000 - Administrative Requirements for submittals procedures.
   B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
   C. Samples:
      1. Identification Nameplates: One of each type and color specified.
      2. Warning Signs and Labels: One of each type and legend specified.
   D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of product.

1.06  QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.

1.07  FIELD CONDITIONS
   A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.
PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

A. Existing Work: Unless specifically excluded, identify existing elements to remain whose designations are changed as part of the new work.

B. Identification for Equipment:

1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
   a. Switchboards:
      1) Identify ampere rating.
      2) Identify voltage and phase.
      3) Use identification nameplate to identify load(s) served for each branch device. Identify spares and spaces.
   b. Motor Control Centers:
      1) Identify ampere rating.
      2) Identify voltage and phase.
      3) Identify power source. Include location.
      4) Use identification nameplate to identify main overcurrent protective device.
      5) Use identification nameplate to identify load(s) served for each branch device. Identify spares and spaces.
   c. Panelboards:
      1) Identify ampere rating.
      2) Identify voltage and phase.
      3) Identify power source and circuit number. Include location.
      4) Identify main overcurrent protective device. Use identification nameplate for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.
      5) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
      6) Identify each circuit by equipment designation or load type. Include location.
      7) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Identify spares and spaces.
   d. Transformers:
      1) Identify kVA rating.
      2) Identify voltage and phase for primary and secondary.
      3) Identify impedance.
      4) Identify power source and circuit number. Include location.
      5) Identify load(s) served. Include location when not within sight of equipment.
   e. Enclosed switches and circuit breakers:
      1) Identify overcurrent protective device ampere rating and type.
         a) Identify fuse class for fusible devices.
      2) Identify voltage and phase.
      3) Identify power source and circuit number. Include location.
      4) Identify load(s) served. Include location when not within sight of equipment.
   f. Transfer Switches:
      1) Identify standby system branch.
         a) Emergency (NFPA 70 Article 700).
         b) Legally Required (NFPA 70 Article 701).
         c) Optional Standby (NFPA 70 Article 702).
      2) Identify ampere rating and number of poles.
      3) Identify voltage and phase.
      4) Identify power source and circuit number for both normal power source and standby power source. Include location.
      5) Identify load(s) served. Include location when not within sight of equipment.
6) Identify short circuit current rating based on the specific overcurrent protective device type and settings protecting the transfer switch.

g. Electricity Meters:
   1) Identify load(s) metered.

2. Service Equipment:
   a. Use identification nameplate to identify each service disconnecting means.

3. Emergency System Equipment:
   a. Use identification nameplate to identify emergency system equipment in accordance with NFPA 70.
   b. Use identification nameplate at each piece of service equipment to identify type and location of on-site emergency power sources.
   c. Use identification nameplate to identify emergency operating instructions for emergency system equipment.

4. Use identification nameplate to identify disconnect location for equipment with remote disconnecting means.

5. Use identification label on inside of door at each fused switch to identify required NEMA fuse class and size.

6. Use identification label to identify overcurrent protective devices for branch circuits serving fire alarm circuits. Identify with text "FIRE ALARM CIRCUIT".

7. Use floor marking tape to identify required equipment working clearances where indicated or where required by the authority having jurisdiction.

8. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
   a. Service equipment.
   b. Equipment control panels.
   c. Motor control centers.

9. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.
   a. Minimum Size: 3.5 by 5 inches (89 mm by 127 mm).
   b. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements" or approved equivalent.
   c. Service Equipment: Include the following information in accordance with NFPA 70.
      1) Nominal system voltage.
      2) Available fault current.
      3) Clearing time of service overcurrent protective device(s).
      4) Date label applied.

C. Identification for Conductors and Cables:
   1. Color Coding for Power Conductors 600 V and Less: Comply with Section 260519.
   2. Use identification label to identify color code for ungrounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment.
   3. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
      a. Within boxes when more than one circuit is present.
      b. Within equipment enclosures when conductors and cables enter or leave the enclosure.
   4. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.

D. Identification for Raceways:

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Identification for Electrical Systems
1. Use color-coded bands or color-coded conduit fittings to identify systems other than normal power system for accessible conduits at maximum intervals of 10 feet (3 m).
   a. Color-Coded Bands: Use field-painting or vinyl color coding electrical tape to mark bands 3 inches (76 mm) wide.
      1) Color Code:
         (a) Emergency and Optional Standby Power System(s): Red.
         (b) Fire Alarm System: Red.
      2) Field-Painting: Comply with Section 099123 and 099113.
      3) Vinyl Color Coding Electrical Tape: Comply with Section 260519.
   2. Use identification labels or handwritten text using indelible marker to identify circuits enclosed for accessible conduits at floor penetrations and at roof penetrations when source is not within sight.
   3. Use identification labels or plastic marker tags to identify spare conduits at each end. Identify purpose and termination location.

E. Identification for Boxes:
   1. Use color coded boxes to identify systems other than normal power system.
      a. Color-Coded Boxes: Field-painted in accordance with Section 099123 and 099113 per the following color code:
         1) Emergency and Optional Standby Power System(s): Red.
         2) Fire Alarm System: Red.
      b. For exposed boxes in public areas, do not color code.
   2. Use identification labels or handwritten text using indelible marker to identify source and circuit numbers enclosed.
   3. Use identification labels or handwritten text using indelible marker to identify fire alarm boxes with "F.A."
      a. For exposed boxes in public areas, use only identification labels.
   4. Use warning labels to identify electrical hazards for boxes containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".

F. Identification for Devices:
   1. Factory Pre-Marked Wallplates: Comply with Section 262726.
   2. Use identification label to identify fire alarm system devices.
   3. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.
      a. For receptacles in public areas or in areas as directed by Architect, provide identification on inside surface of wallplate.
   4. Use identification label or engraved wallplate to identify load controlled for wall-mounted control devices controlling loads that are not visible from the control location and for multiple wall-mounted control devices installed at one location.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
   1. Manufacturers:
   2. Materials:
      a. Indoor Clean, Dry Locations: Use plastic nameplates.
      b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
   3. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch (1.6 mm); engraved text.
   4. Stainless Steel Nameplates: Minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
5. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
6. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch (25 mm) high; Four, located at corners for larger sizes.

B. Identification Labels:
   1. Manufacturers:
      c. Markal Corp.
      d. LEM Products, Inc.
      e. Ideal Industries, Inc.
      a. Use only for indoor locations.
   3. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:
   1. Minimum Size: 1 inch (25 mm) by 2.5 inches (64 mm).
   2. Legend:
      a. System designation where applicable:
         1) Emergency Power System: Identify with text "EMERGENCY".
      b. Equipment designation or other approved description.
      c. Other information as indicated.
   3. Text: All capitalized unless otherwise indicated.
   4. Minimum Text Height:
      a. System Designation: 1/2 inch (13 mm).
      b. Equipment Designation: 1/2 inch (13 mm).
      c. Other Information: 1/4 inch (6 mm).
   5. Color:

D. Format for General Information and Operating Instructions:
   1. Minimum Size: 2 inches (51 mm) by 4 inches (100 mm).
   2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
   3. Text: All capitalized unless otherwise indicated.
   4. Minimum Text Height: 1/4 inch (6 mm).
   5. Color: Black text on white background unless otherwise indicated.
      a. Exceptions:
         1) Provide white text on red background for general information or operational instructions for emergency systems.

E. Format for Caution and Warning Messages:
   1. Minimum Size: 2 inches (51 mm) by 4 inches (100 mm).
   2. Legend: Include information or instructions indicated or as required for proper and safe operation and maintenance.
   3. Text: All capitalized unless otherwise indicated.
   4. Minimum Text Height: 1/2 inch (13 mm).
   5. Color: Black text on yellow background unless otherwise indicated.

2.03 WIRE AND CABLE MARKERS

A. Manufacturers:
   3. Ideal Industries, Inc.
4. LEM Products, Inc.
5. Markal Corp.

B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl self-laminating type markers suitable for the conductor or cable to be identified.

C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

D. Legend: Power source and circuit number or other designation indicated.

E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
1. Do not use handwritten text.

F. Minimum Text Height: 1/8 inch (3 mm).

G. Color: Black text on white background unless otherwise indicated.

2.04 FLOOR MARKING TAPE

A. Manufacturers:
2. Ideal Industries, Inc.
3. LEM Products, Inc.
4. Markal Corp.
5. Panduit Corp

B. Floor Marking Tape for Equipment Working Clearance Identification: Self-adhesive vinyl or polyester tape with overlaminate, 3 inches (76 mm) wide, with alternating black and white stripes.

2.05 WARNING SIGNS AND LABELS

A. Manufacturers:

B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

C. Warning Signs:
1. Materials:
   a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic signs.
   2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
   3. Minimum Size: 7 by 10 inches (178 by 254 mm) unless otherwise indicated.

D. Warning Labels:
1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by the label manufacturer.
3. Minimum Size: 2 by 4 inches (51 mm by 102 mm) unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
4. Elevated Equipment: Legible from the floor or working platform.
5. Branch Devices: Adjacent to device.
6. Interior Components: Legible from the point of access.
7. Conduits: Legible from the floor.
8. Boxes: Outside face of cover.
9. Conductors and Cables: Legible from the point of access.
10. Devices: Outside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing.
   1. Do not use adhesives on exterior surfaces except where substrate can not be penetrated.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Secure rigid signs using stainless steel screws.

G. Mark all handwritten text, where permitted, to be neat and legible.

3.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION 260553
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SECTION 260573
POWER SYSTEM STUDIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Short-circuit study.
B. Protective device coordination study.
C. Arc flash and shock risk assessment.
   1. Includes arc flash hazard warning labels.
D. Criteria for the selection and adjustment of equipment and associated protective devices not specified in this section, as determined by studies to be performed.

1.02 RELATED REQUIREMENTS

A. Section 260553 - Identification for Electrical Systems: Additional requirements for arc flash hazard warning labels.
B. Section 262413 - Switchboards.
C. Section 262416 - Panelboards.
D. Section 262813 - Fuses.
E. Section 262816.16 - Enclosed Switches.
F. Section 262913 - Enclosed Controllers.

1.03 REFERENCE STANDARDS

G. NEMA MG 1 - Motors and Generators 2021.
I. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
J. NFPA 70E - Standard for Electrical Safety in the Workplace 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Existing Installations: Coordinate with equipment manufacturer(s) to obtain data necessary for completion of studies.
   2. Coordinate the work to provide equipment and associated protective devices complying with criteria for selection and adjustment, as determined by studies to be performed.
   3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:
1. Submit study reports concurrent with product submittals.
2. Do not order equipment until matching study reports and product submittals have both been evaluated by Architect.
3. Verify naming convention for equipment identification prior to creation of final drawings, reports, and arc flash hazard warning labels (where applicable).

C. Scheduling:
   1. Arrange access to existing facility for data collection with Owner.
   2. Where work of this section involves interruption of existing electrical service, arrange service interruption with Owner.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Study preparer's qualifications.
C. Study reports, stamped or sealed and signed by study preparer. Submit concurrent with product data for Section 26 24 15 - Panelboards and Section 26 24 13 - Switchboards.
D. Product Data: In addition to submittal requirements specified in other sections, include manufacturer's standard catalog pages and data sheets for equipment and protective devices indicating information relevant to studies.
   1. Include characteristic time-current trip curves for protective devices.
   2. Identify modifications made in accordance with studies that:
      a. Can be made at no additional cost to Owner.
      b. As submitted will involve a change to the contract sum.
E. Arc Flash Hazard Warning Label Samples: One of each type and legend specified.
F. Field quality control reports.
G. Certification that field adjustable protective devices have been set in accordance with requirements of studies.
H. Project Record Documents: Revise studies as required to reflect as-built conditions.
   1. Include hard copies with operation and maintenance data submittals.
   2. Include computer software files used to prepare studies with file name(s) cross-referenced to specific pieces of equipment and systems.

1.06 POWER SYSTEM STUDIES

A. Scope of Studies:
   1. Perform analysis of both new and directly affected existing portions of the electrical distribution system.
   2. Except where study descriptions below indicate exclusions, analyze system at each bus from primary protective devices of utility source down to each piece of equipment involved, including parts of system affecting calculations being performed (e.g. fault current contribution from motors).
   3. Include in analysis alternate sources and operating modes (including known future configurations) to determine worst case conditions.
      a. Known Operating Modes:
         1) Utility as source.
         2) Generator as source.
         3) Maintenance settings.
B. General Study Requirements:
   1. Comply with NFPA 70.
   2. Perform studies utilizing computer software complying with specified requirements; manual calculations are not permitted.
C. Data Collection:
   1. Compile information on project-specific characteristics of actual installed equipment, protective devices, feeders, etc. as necessary to develop single-line diagram of electrical distribution system and associated input data for use in system modeling.
a. Utility Source Data: Include primary voltage, maximum and minimum three-phase and line-to-ground fault currents, impedance, X/R ratio, and primary protective device information.
   1) Obtain up-to-date information from Owner.

b. Motors: Include manufacturer/model, type (e.g. induction, synchronous), horsepower rating, voltage rating, full load amps, and locked rotor current or NEMA MG 1 code letter designation.

c. Transformers: Include primary and secondary voltage ratings, kVA rating, winding configuration, percent impedance, and X/R ratio.

d. Protective Devices:
   1) Circuit Breakers: Include manufacturer/model, type (e.g. thermal magnetic, electronic trip), frame size, trip rating, voltage rating, interrupting rating, available field-adjustable trip response settings, and features (e.g. zone selective interlocking).
   2) Fuses: Include manufacturer/model, type/class (e.g. Class J), size/rating, and speed (e.g. time delay, fast acting).

e. Protective Relays: Include manufacturer/model, type, settings, current/potential transformer ratio, and associated protective device.

f. Conductors: Include feeder size, material (e.g. copper, aluminum), insulation type, voltage rating, number per phase, raceway type, and actual length.

g. Collect data on existing electrical distribution system necessary for completion of studies, including field verification of available existing data (e.g. construction documents, previous studies). Include actual settings for field-adjustable devices.

D. Short-Circuit Study:
   2. For purposes of determining equipment short circuit current ratings, consider conditions that may result in maximum available fault current, including but not limited to:
      a. Maximum utility fault currents.
      b. Maximum motor contribution.
      c. Known operating modes (e.g. utility as source, generator as source, utility/generator in parallel, bus tie breaker open/close positions).
   3. For each bus location, calculate the maximum available three-phase bolted symmetrical and asymmetrical fault currents. For grounded systems, also calculate the maximum available line-to-ground bolted fault currents.

E. Protective Device Coordination Study:
   1. Comply with applicable portions of IEEE 242 and IEEE 399.
   2. Analyze alternate scenarios considering known operating modes (e.g. utility as source, generator as source, utility/generator in parallel, bus tie breaker open/close positions).
   3. Analyze protective devices and associated settings for suitable margins between time-current curves to achieve full selective coordination while providing adequate protection for equipment and conductors.
   4. Include overcurrent protective devices upstream of step-down transformers. Select overcurrent protection such that devices do not open during worst case transformer inrush for the submitted transformers.
   5. Include all devices for Emergency Systems and Legally Required Standby Systems. Select overcurrent protection complying with NEC requirements
   6. Include ground fault coordination study for all ground fault protection devices and for 20A circuit breakers operating at the same voltage as ground fault protection devices.

F. Arc Flash and Shock Risk Assessment:
   1. Comply with NFPA 70E.
   2. Perform incident energy and arc flash boundary calculations in accordance with IEEE 1584 (as referenced in NFPA 70E Annex D), where applicable.
      a. To clarify IEEE 1584 statement that "equipment below 240 V need not be considered unless it involves at least one 125 kVA or larger low-impedance transformer in its immediate power supply" for purposes of studies, study preparer to include
equipment rated less than 240 V fed by transformers less than 125 kVA in calculations.

3. For equipment with main devices mounted in separate compartmentalized sections, perform calculations on both the line and load side of the main device.

4. Analyze alternate scenarios considering conditions that may result in maximum incident energy, including but not limited to:
   a. Maximum and minimum utility fault currents.
   b. Maximum and minimum motor contribution.
   c. Known operating modes (e.g. utility as source, generator as source, utility/generator in parallel, bus tie breaker open/close positions).

G. Study Reports:
   1. General Requirements:
      a. Identify date of study and study preparer.
      b. Identify study methodology and software product(s) used.
      c. Identify scope of studies, assumptions made, implications of possible alternate scenarios, and any exclusions from studies.
      d. Identify base used for per unit values.
      e. Include single-line diagram and associated input data used for studies; identify buses on single-line diagram as referenced in reports, and indicate bus voltage.
      f. Include conclusions and recommendations.
   2. Short-Circuit Study:
      a. For each scenario, identify at each bus location:
         1) Calculated maximum available symmetrical and asymmetrical fault currents (both three-phase and line-to-ground where applicable).
         2) Fault point X/R ratio.
         3) Associated equipment short circuit current ratings.
      b. Identify locations where the available fault current exceeds the equipment short circuit current rating, along with recommendations.
   3. Protective Device Coordination Study:
      a. For each scenario, include time-current coordination curves plotted on log-log scale graphs.
      b. For each graph include (where applicable):
         1) Partial single-line diagram identifying the portion of the system illustrated.
         2) Protective Devices: Time-current curves with applicable tolerance bands for each protective device in series back to the source, plotted up to the maximum available fault current at the associated bus.
         3) Conductors: Damage curves.
         4) Generators: Full load current, overload curves, decrement curves, and short circuit withstand points.
         5) Motors: Full load current, starting curves, and damage curves.
      c. For each protective device, identify fixed and adjustable characteristics with available ranges and recommended settings,
         1) Circuit Breakers: Include long time pickup and delay, short time pickup and delay, and instantaneous pickup.
         2) Include ground fault pickup and delay.
         3) Include fuse ratings.
      d. Identify cases where either full selective coordination or adequate protection is not achieved, along with recommendations.
   4. Arc Flash and Shock Risk Assessment:
      a. For each scenario, identify at each bus location:
         1) Calculated incident energy and associated working distance.
         2) Calculated arc flash boundary.
         3) Bolted fault current.
         4) Arcing fault current.
         5) Clearing time.
6) Arc gap distance.
   b. For purposes of producing arc flash hazard warning labels, summarize the maximum
      incident energy and associated data reflecting the worst case condition of all
      scenarios at each bus location.
   c. Identify locations where the calculated maximum incident energy exceeds 40 calories
      per sq cm.
   d. Include recommendations for reducing the incident energy at locations where the
      calculated maximum incident energy exceeds 8 calories per sq cm.

1.07 QUALITY ASSURANCE
   A. Study Preparer Qualifications: Professional electrical engineer licensed in the State in which
      the Project is located and with minimum five years experience in the preparation of studies of
      similar type and complexity using specified computer software.
      1. Study preparer may be employed by the manufacturer of the electrical distribution
         equipment.
      2. Study preparer may be employed by field testing agency.
   B. Field Testing Agency Qualifications: Independent testing organization specializing in testing,
      analysis, and maintenance of electrical systems with minimum five years experience.
   C. Computer Software for Study Preparation: Use the latest edition of commercially available
      software utilizing specified methodologies.
      1. Acceptable Software Products:

PART 2 PRODUCTS
2.01 ARC FLASH HAZARD WARNING LABELS
   A. Provide warning labels complying with ANSI Z535.4 to identify arc flash hazards for each work
      location analyzed by the arc flash and shock risk assessment.
      1. Materials: Comply with Section 260553.
      2. Minimum Size: 4 by 6 inches (100 by 150 mm).
      3. Legend: Provide custom legend in accordance with NFPA 70E based on equipment-
         specific data as determined by arc flash and shock risk assessment.
         a. Include orange header that reads "WARNING" where calculated incident energy is
            less than 40 calories per square cm.
         b. Include red header that reads "DANGER" where calculated incident energy is 40
            calories per square cm or greater.
         c. Include the text "Arc Flash and Shock Hazard; Appropriate PPE Required".
         d. Include the following information:
            1) Arc flash boundary.
            2) Available incident energy and corresponding working distance.
            3) Site-specific PPE (personnel protective equipment) requirements.
            4) Nominal system voltage.
            5) Limited approach boundary.
            6) Restricted approach boundary.
            7) Equipment identification.
            8) Date calculations were performed.

PART 3 EXECUTION
3.01 INSTALLATION
   A. Install arc flash warning labels in accordance with Section 260553.

3.02 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Provide the services of field testing agency or equipment manufacturer's representative to
      perform inspection, testing, and adjusting.
C. Inspect and test in accordance with NETA ATS, except Section 4.
D. Adjust equipment and protective devices for compliance with studies and recommended settings.
E. Notify Architect of any conflicts with or deviations from studies. Obtain direction before proceeding.
F. Submit detailed reports indicating inspection and testing results, and final adjusted settings.

3.03 CLOSEOUT ACTIVITIES

A. See Section 017800 - Closeout Submittals, for closeout submittals.
B. See Section 017900 - Demonstration and Training, for additional requirements.

END OF SECTION 260573
SECTION 260583
WIRING CONNECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Electrical connections to equipment.

1.02 RELATED REQUIREMENTS
A. Section 260519 - Low-Voltage Electrical Conductors and Cables.
B. Section 260529 - Hangers and Supports for Electrical Systems.
C. Section 260533.13 - Conduit for Electrical Systems.
D. Section 260533.16 - Boxes for Electrical Systems.
E. Section 262816.16 - Enclosed Switches.

1.03 REFERENCE STANDARDS
A. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
   2. Determine connection locations and requirements.
B. Sequencing:
   1. Install rough-in of electrical connections before installation of equipment is required.
   2. Make electrical connections before required start-up of equipment.

1.05 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.01 MATERIALS
A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
   1. Colors: Conform to NEMA WD 1.
   2. Cord Construction: NFPA 70, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
   3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
B. Enclosed Switches: As specified in Section 262816.16 and in individual equipment sections.
C. Flexible Conduit: As specified in Section 260533.13.
D. Wire and Cable: As specified in Section 260519.
E. Boxes: As specified in Section 260533.16.
F. Supports for Disconnect Switches and Controllers: As specified in Section 260529 - Hangers and Supports for Electrical Systems

2.02 EQUIPMENT CONNECTIONS
A. Ratings, configurations, and features as indicated on the drawings, including the equipment schedules.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS
   A. Make electrical connections in accordance with equipment manufacturer’s instructions.
   B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
   C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
   D. Provide cord and cap where field-supplied attachment plug is required.
   E. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
   F. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
      1. Where equipment is located adjacent to an available wall, install electrical disconnect switches and controllers on wall while maintaining required electrical and equipment clearances.
      2. Where equipment is not located adjacent to a wall or where required electrical and equipment clearances cannot be maintained, install electrical disconnect switches and controllers free standing metal channel (strut) framing systems near equipment.
      3. Where equipment is located outdoors, including rooftops, mount electrical disconnect switches and controllers onto equipment enclosures only where allowed by the manufacturer; otherwise, install electrical disconnect switches and controllers on free standing metal channel (strut) framing systems near equipment.
   G. Install terminal block jumpers to complete equipment wiring requirements.
   H. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION 260583
SECTION 260800
ELECTRICAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
   1. Verify that the work is installed in accordance with the Contract Documents and the manufacturer’s recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by Contractor are utilized to achieve this.
   2. Verify and document that functional performance is in accordance with the Contract Documents. Functional Tests executed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
   3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
   4. Verify that the Owner’s operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Substantial Completion.

C. The Commissioning Authority directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Authority's responsibilities.

D. The Commissioning Authority is employed by Construction Manager on behalf of Owner.

1.02 SCOPE OF COMMISSIONING

A. Summary: Commissioning includes demonstration and testing of electrical power systems, controls and special systems for correct operation and for compliance with the Contract Documents and manufacturer's requirements.

B. Electrical Systems:
   1. Conductors and cables.
   2. Grounding systems.
   3. Low-voltage transformers.
   4. Switchboards.
   5. Panelboards.

C. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

1.03 RELATED REQUIREMENTS

A. Section 017000 - Execution and Closeout Requirements: General startup requirements.

B. Section 017800 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.

C. Section 017900 - Demonstration and Training: Scope and procedures for Owner personnel training.

D. Section 260519 - Low-Voltage Electrical Conductors and Cables for additional testing requirements, including NETA ATS.

E. Section 260526 - Grounding and Bonding for Electrical Systems for additional testing requirements, including NETA ATS.

F. Section 260573 - Power System Studies for protective device settings.

G. Section 262200 - Low-Voltage Transformers for additional testing requirements, including NETA ATS.
H. Section 262413 - Switchboards for additional testing requirements, including NETA ATS.
I. Section 262416 - Panelboards for additional testing requirements, including NETA ATS.

1.04 REFERENCE STANDARDS
B. NEMA ST 20 - Dry Type Transformers for General Applications 2021.
D. NFPA 70 (NIST) - National Electrical Code 2014 or Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
E. NFPA 70E - Standard for Electrical Safety in the Workplace 2024.
F. NIST N 7101.64 - Electrical Safety.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority, unless they require review by Architect; in that case, submit to Architect first.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of Prefunctional Checklists or Functional Test requirements; submit in editable electronic format, Microsoft Word 2010 preferred.
   5. As soon as possible after submittals are approved, submit copy of approved submittal to the Commissioning Authority.
B. Manufacturers' Instructions: Submit copies of all manufacturer-provided instructions that are shipped with the equipment as soon as the equipment is delivered.
C. Startup Plans and Reports.
D. Completed Prefunctional Checklists.
E. Inspection and Test Reports: Include the following:
   1. Summary of project.
   2. Description of equipment tested.
   3. Description of test.
   4. Test results.
   5. Analysis and recommendations.
   6. Appendix, including test forms.
   7. Calibration reports for test instruments.

PART 2 PRODUCTS
2.01 TEST EQUIPMENT
A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.
B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:
   1. Calibration: According to the manufacturer’s recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.
C. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to

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Electrical Commissioning Requirements
PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Commissioning Authority responsibilities:
   1. Coordinate and direct the commissioning process.
   2. Cooperate with the Contractor.
   3. Review commissioning documentation.
   4. Commissioning Authority will prepare the Commissioning Plan.
   5. Commissioning Authority will prepare the initial Prefunctional Checklists.

B. Engineer responsibilities:
   1. Attend commissioning kickoff meeting.
   2. Review commissioning documentation.
   3. Provide technical support to the Commissioning Authority.

C. Contractor responsibilities:
   1. Complete installation and testing specified in other sections prior to commissioning.
   2. Provide equipment, materials, and skilled personnel for commissioning activities.
   3. Comply with the Commissioning Plan.
   4. Cooperate with the Commissioning Authority.
   5. Prepare Startup Plan.
   6. Perform Startup activities.
   7. Prepare Startup Reports.
   8. Complete Prefunctional Checklists.
   11. Prepare Functional Test Reports.
   13. Confirm completion and correct function of installed systems.
   14. Make required adjustments to allow intended functionality and interoperability.
   15. Provide equipment, materials, and labor to correct deficiencies found during the commissioning process.
   16. Attend meetings called by the Commissioning Authority.
      a. Establish commissioning process, requirements, roles, and responsibilities.
      b. Update the Commissioning Plan.
      c. Review the Prefunctional Checklists.
      d. Review commissioning results and corrective measures.
   17. Require participation at meetings by relevant subcontractors, installers, suppliers, and manufacturer representatives.
   18. Provide timely and accurate documentation submittals.

D. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.

E. Commissioning Schedule:
   1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Authority within 60 days after award of Contract.
   2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
   3. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
   4. Provide sufficient notice to Commissioning Authority for delivery of relevant Checklists and Functional Test procedures, to avoid delay.

3.02 DOCUMENTATION IDENTIFICATION SYSTEM

A. Give each submitted form or report a unique identification.

B. Type of Document: Use the following prefixes:
1. Startup Plan: SP-
2. Startup Report: SR-
3. Prefunctional Checklist: PC-
4. Functional Test Procedure: FTP-
5. Functional Test Report: FTR-

C. System Type: Use the digits from CSI/CSC MF (Master Format), that are applicable to the system; for example:
   1. 260943: Network Lighting Controls.

D. Component Number: Assign numbers sequentially, using 1, 2, or 3 digits as required to accommodate the number of units in the system.

E. Test, Revision, or Submittal Number: Number each successive iteration sequentially, starting with 1.

F. Example: FTP-260923-001.2 would be the second, revised submittal of the Functional Test Procedure for equipment item 1 (such as occupancy sensors) in the Lighting Control system.

3.03 STARTUP PLANS AND REPORTS
   A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.
   
   B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.

   C. Submit directly to the Commissioning Authority.

3.04 PREFUNCTIONAL CHECKLISTS
   A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
      1. No sampling of identical or near-identical items is allowed.
      2. These checklists do not replace manufacturers’ recommended startup checklists, regardless of apparent redundancy.
      3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
         a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
         b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
         c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
         d. Serial number of installed unit.
         e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer’s start-up checklist items and minor testing.

   B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Owner is not required unless otherwise specified.
      1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
      2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
      3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
4. If any Checklist line item is not relevant, record reasons on the form.
5. Contractor may independently perform startup inspections and/or tests, at his option.
6. Regardless of these reporting requirements, Contractor is responsible for correct startup
   and operation.
7. Submit completed Checklists to Commissioning Authority.

C. Commissioning Authority will prepare the Prefunctional Checklists.
   1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so
      indicated in the Contract Documents.
   2. Provide all additional information requested by Commissioning Authority to aid in
      preparation of checklists, such as shop drawing submittals, manufacturers' startup
      checklists, and O&M data.
   3. Commissioning Authority may add any relevant items deemed necessary regardless of
      whether they are explicitly mentioned in the Contract Documents or not.
   4. When asked to review the proposed Checklists, do so in a timely manner.

D. Commissioning Authority Witnessing: Required for:
   1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by
      the commissioning plan.
   2. A sampling of non-primary equipment, as allowed by the commissioning plan.

E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to
   Owner.
   1. If difficulty in correction would delay progress, report deficiency to the Commissioning
      Authority immediately.

3.05 FUNCTIONAL TESTS

A. A Functional Test is required for each item of equipment, system, or other assembly specified
   to be commissioned, unless sampling of multiple identical or near-identical units is allowed by
   the final test procedures.

B. Contractor is responsible for execution of required Functional Tests, after completion of
   Prefunctional Checklist and before closeout.

C. Commissioning Authority is responsible for witnessing and reporting results of Functional Tests,
   including preparation and completion of forms for that purpose.

D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner;
   if a deficiency is not corrected and re-tested immediately.
   1. The Commissioning Authority will document the deficiency and the Contractor's stated
      intentions regarding correction
   2. Deficiencies are any condition in the installation or function of a component, piece of
      equipment or system that is not in compliance with the Contract Documents or does not
      perform properly.
   3. Use the standard form provided with copies submitted to Owner and Contractor.
   4. When the deficiency has been corrected, the Contractor completes the form certifying that
      the item is ready to be re-tested and returns the form to the Commissioning Authority.
   5. The Commissioning Authority will reschedule the test and the Contractor shall re-test.
   6. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical
      or near-identical items fail to perform due to material or manufacturing defect, all items will
      be considered defective; provide a proposal for correction within 2 weeks after notification
      of defect, including provision for testing sample installations prior to replacement of all
      items.
   7. Contractor shall bear the cost of Owner and Commissioning Authority personnel time
      witnessing re-testing.
   8. Contractor shall bear the cost of Owner and Commissioning Authority personnel time
      witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional
      Checklist correctly; if the test failed for reasons that would not have been identified in the
      Prefunctional Checklist process, Contractor shall bear the cost of the second and
      subsequent re-tests.
E. Functional Test Procedures:
   1. Functional Test procedures are not included in the Contract Documents, test procedures will be determined by the Commissioning Authority with input by and coordination with Contractor.
   
F. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Contractor's responsibility regardless of timing.

G. Factory Tests: Commissioning Authority and Contractor are responsible for coordinating testing of equipment at the factory by factory personnel, to ensure compliance with commissioning requirements.

H. Field Tests By Others: Where Functional Tests are indicated as to be performed by others not subject to the Contract Documents, those tests are not subject to these commissioning requirements.

3.06 TEST PROCEDURES - GENERAL

A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

B. Provide all necessary materials and system modifications required to produce the conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.

C. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the “observation”).

D. Submit detailed reports indicating inspection and testing results and corrective actions taken.

3.07 ELECTRICAL TESTING AND COMMISSIONING

A. Low Voltage Conductors and Cables:
   2. Continuity: Test continuity of each conductor.
   3. Insulation Resistance: Test each conductor with respect to ground and adjacent conductors.
      a. Apply 1,000 Volts DC for 600-Volt rated conductors for test duration of one minute.
      b. Insulation resistance values shall be in accordance with manufacturer's published data. In the absence of manufacturer’s published data, minimum insulation resistance shall be:
         1) 25 mega-Ohms for conductors feeding 250-Volt rated equipment.
         2) 100 mega-Ohms for conductors feeding 600-Volt rated equipment.
      c. Investigate non-compliant insulation resistance values.
   5. See Section 260519 - Low-Voltage Electrical Conductors and Cables for additional requirements.

B. Grounding Systems:
   1. Electrode Conductors: Verify conductor sizes match drawings.
   2. Bolted Connections: Inspect and verify tightness of bolted electrical connections with a calibrated torque-wrench in accordance with manufacturer’s published data.
   3. See Section 260526 - Grounding and Bonding for Electrical Systems for additional requirements.

C. Low-voltage Transformers:
1. Bolted Connections: Inspect and verify tightness of bolted electrical connections with a calibrated torque-wrench in accordance with manufacturer's published data.
2. Thermographic Survey: Perform thermographic survey of equipment and connections with imaging equipment during maximum possible loading:
   a. Identify areas inspected, inaccessible or unobservable areas and equipment, and load conditions at the time of survey.
   b. Identify temperature difference between the area of concern and the reference area, probable cause of temperature difference, and corrective actions.
   c. Provide photograph and thermographic of each deficient area.
3. Ground Resistance: Measure each winding-to-ground insulation resistance.
5. Sound Level: Verify sound level is in accordance with NEMA ST 20.
6. See Section 262200 - Low-Voltage Transformers for additional requirements.

D. Switchboards:
1. Main Overcurrent Protection: Verify that fuse or circuit breaker ratings match drawings.
2. Bolted Connections: Inspect and verify tightness of bolted electrical connections with a calibrated torque-wrench in accordance with manufacturer’s published data.
3. Thermographic Survey: Perform thermographic survey of equipment and connections with imaging equipment during maximum possible loading:
   a. Identify areas inspected, inaccessible or unobservable areas and equipment, and load conditions at the time of survey.
   b. Identify temperature difference between the area of concern and the reference area, probable cause of temperature difference, and corrective actions.
   c. Provide photograph and thermographic of each deficient area.
4. Ground Resistance: Measure the system neutral-to-ground insulation resistance with the neutral disconnect link temporarily removed. Replace the neutral disconnect link after testing.
5. Insulation Resistance: Perform insulation-resistance tests on each bus section, phase-to-phase and phase-to-ground, for duration of one minute.
6. Circuit Breakers:
   a. Operate circuit breakers to insure smooth and proper operation.
   b. Inspect operating mechanism, contacts, and arc chutes in unsealed units.
   c. Adjust protective device settings in accordance with the coordination study results required by Section 260573 - Power System Studies.
   d. Determine long-time, short-time, and ground-fault pickups and delays by primary current injections. Values shall be as specified, and the trip characteristic shall not exceed manufacturer’s published time-current characteristic tolerance band.
   e. Determine instantaneous pickup by primary current injection. Values shall be as specified and within manufacturer’s published tolerances.
   f. Perform minimum pickup voltage tests on shunt trip and close coils.
   g. Verify correct operation of auxiliary features and components.
7. Ground Fault Protection:
   a. Inspect components for damage and errors in polarity or conductor routing.
   b. Verify ground connection is on the source side of the neutral disconnect link and on the source side of the ground fault sensor.
   c. Verify that the grounded conductor is solidly grounded.
   d. Verify correct and functional operation of the ground fault panel or device.
   e. Verify pickup and time delay settings.
   f. Perform ground fault protective device pickup tests using primary injection.
8. See Section 262413 - Switchboards for additional requirements.

E. Panelboards:
1. Bolted Connections: Inspect and verify tightness of bolted electrical connections with a calibrated torque-wrench in accordance with manufacturer's published data.
2. Thermographic Survey: Perform thermographic survey of equipment and connections with imaging equipment during maximum possible loading:
   a. Identify areas inspected, inaccessible or unobservable areas and equipment, and load conditions at the time of survey.
   b. Identify temperature difference between the area of concern and the reference area, probable cause of temperature difference, and corrective actions.
   c. Provide photograph and thermographic of each deficient area.
3. See Section 262416 - Panelboards for additional requirements.

F. Electrical Metering:
   1. Inspect meter and case physical condition, anchorage, and grounding.
   2. Verify correct and functional operation of display and selector devices.
   3. Record manufacturer and model number, software version, and passwords.
   4. Set parameters, including instrument transformer ratios, voltage, frequency, power demand intervals, and communications requirements.
   5. Verify correct measurements and indications with applied loads.
   6. Verify correct and functional operation with BAS monitoring system.
   7. Perform functional tests identified on the Prefunctional Checklist forms in accordance with the commissioning plan.

3.08 OPERATION AND MAINTENANCE MANUALS
A. See Section 017800 - Closeout Submittals for additional requirements.
B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.
C. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.
D. Commissioning Authority will add commissioning records to manuals after submission to Owner.

END OF SECTION 260800
SECTION 262200
LOW-VOLTAGE TRANSFORMERS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. General purpose transformers.

1.02 RELATED REQUIREMENTS
A. Section 033000 - Cast-in-Place Concrete: Concrete equipment pads.
B. Section 260526 - Grounding and Bonding for Electrical Systems.
C. Section 260529 - Hangers and Supports for Electrical Systems.
D. Section 260533.13 - Conduit for Electrical Systems: Flexible conduit connections.
E. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
F. Section 26 08 00 - Electrical Commissioning Requirements: Additional requirements for Commissioning.
G. Section 262416 - Panelboards.
H. Section 262713 - Electricity Metering: Instrument transformers for electrical metering.

1.03 REFERENCE STANDARDS
A. IEEE C57.94 - IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type Distribution and Power Transformers 2015.
D. NECA 409 - Standard for Installing and Maintaining Dry-Type Transformers 2015.
E. NEMA ST 20 - Dry Type Transformers for General Applications 2021.
H. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
J. UL 1561 - Standard for Dry-Type General Purpose and Power Transformers Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate the work with placement of supports, anchors, etc. required for mounting.
   4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
   5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
B. Coordination: Coordinate the work with placement of support framing and anchors required for mounting of transformers.
1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Include voltage, kVA, impedance, tap configurations, insulation system class and rated temperature rise, sound level, enclosure ratings, outline and support point dimensions, weight, required clearances, service condition requirements, and installed features.
   1. Efficiency: 25%, 50%, 75%, 100% of rated load.
   2. Vibration Isolators: Include attachment method and rated load and deflection.
C. Shop Drawings: Provide dimensioned plan and elevation views of transformers and adjacent equipment with all required clearances indicated.
D. Coordination drawings: provide scaled drawings of electrical rooms, with existing and new proposed equipment shown. Scale shall be $\frac{1}{4}" = 1\'-0\"$.
E. Source Quality Control Test Reports: Include reports for tests designated in NEMA ST 20 as design and routine tests.
F. Field Quality Control Test Reports.
G. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
H. Maintenance Data: Include recommended maintenance procedures and intervals.
I. Project Record Documents: Record actual locations of transformers.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
B. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

1.08 FIELD CONDITIONS
A. Ambient Temperature: Do not exceed the following maximum temperatures during and after installation of transformers.
   1. Greater than 10 kVA: 104 degrees F (40 degrees C) maximum.
   2. Less than 10 kVA: 77 degrees F (25 degrees C) maximum.

1.09 WARRANTY
A. 25 year. See Section 017800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS
2.01 MANUFACTURERS
B. Schneider Electric; Square D Products: www.schneider-electric.us/#sle.

2.02 TRANSFORMERS - GENERAL REQUIREMENTS
A. Description: Factory-assembled, dry type transformers for 60 Hz operation designed and manufactured in accordance with NEMA ST 20 and listed, classified, and labeled as suitable for Low-Voltage Transformers
the purpose intended.

B. Unless noted otherwise, transformer ratings indicated are for continuous loading according to IEEE C57.96 under the following service conditions:
   1. Altitude: Less than 6,600 feet (2,000 m).
      a. Derate for high altitudes: Derate 0.5 percent for each 330 feet (100 m) above 3,300 feet (1,000 m) mean seal level.
      b. Ambient Temperature: Not exceeding 104 degrees F (40 degrees C).

C. Core: High grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses. Keep magnetic flux densities substantially below saturation point, even at 10 percent primary overvoltage. Tightly clamp core laminations to prevent plate movement and maintain consistent pressure throughout core length.

D. Impregnate core and coil assembly with non-hygroscopic thermo-setting varnish to effectively seal out moisture and other contaminants.

E. Basic Impulse Level: 10 kV.

F. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.

G. Isolate core and coil from enclosure using vibration-absorbing mounts.

H. Nameplate: Include transformer connection data, ratings, wiring diagrams, and overload capacity based on rated winding temperature rise.

2.03 GENERAL PURPOSE TRANSFORMERS

A. Description: Self-cooled, two winding transformers listed and labeled as complying with UL 506 or UL 1561; ratings as indicated on the drawings.

B. Insulation System and Allowable Average Winding Temperature Rise:
   1. Less than 15 kVA: Class 185 degrees C insulation system with 80 degrees C average winding temperature rise.
   2. 15 kVA and Larger: Class 200 degrees C insulation system with 115 degrees C average winding temperature rise.

C. Coil Conductors: Continuous aluminum windings with terminations brazed or welded.

D. Winding Taps:
   1. Less than 3 kVA: None.
   2. 3 kVA through 15 kVA: Two 5 percent full capacity primary taps below rated voltage.
   3. 15 kVA through 300 kVA: Two 2.5 percent full capacity primary taps above and four 2.5 percent full capacity primary taps below rated voltage.
   4. 500 kVA and Larger: Two 2.5 percent full capacity primary taps above and four 2.5 percent full capacity primary taps below rated voltage.

E. Energy Efficiency: Transformers shall be high efficiency type. Comply with current requirements of DOE minimum efficiency ratings, ANSI/NEMA Standards TP-1 and TP-2. Minimum efficiency at full load shall be as follows:
   1. 15 kVA: 97%
   2. 30 kVA: 98.25%
   3. 45 kVA: 98.39%
   4. 75 kVA: 98.6%
   5. 112.5 kVA: 98.74%
   6. 150 kVA: 98.81%
   7. 225 kVA: 98.5%
   8. 300 kVA: 99%
   9. 500 kVA: 99.16%

F. Sound Levels: Low sound levels with maximum sound levels as follows:
   1. 0-45 kVA: 42 dB
   2. 75-150 kVA: 47 dB
   3. 225-300 kVA: 52 dB
4. 500 kVA: 57 dB

G. Mounting Provisions:
   1. Less than 15 kVA: Suitable for wall mounting.
   2. 15 kVA through 75 kVA: Suitable for floor or trapeze mounting.
   3. Larger than 75 kVA: Suitable for floor mounting.

   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor clean, dry locations: Type 2.
   2. Construction: Steel.
      a. Less than 15 kVA: Totally enclosed, non-ventilated.
      b. 15 kVA and Larger: Ventilated.
   3. Finish: Manufacturer's standard grey, suitable for outdoor installations.
   4. Provide lifting eyes or brackets.

I. Accessories:
   1. Mounting Brackets: Provide manufacturer's standard brackets.
   2. Lug Kits: Sized as required for termination of conductors as indicated.

2.04 SOURCE QUALITY CONTROL

A. Factory test transformers according to NEMA ST 20.

B. Sound Level Tests: Perform factory test designated in NEMA ST 20 as "design" test on each production unit.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that suitable support frames and anchors are installed where required and that mounting surfaces are ready to receive transformers.

B. Perform pre-installation tests and inspections on transformers per manufacturer's instructions and as specified in NECA 409. Correct deficiencies prior to installation.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).

B. Install products in accordance with manufacturer's instructions.

C. Install transformers in accordance with NECA 409 and IEEE C57.94.

D. Use flexible conduit, under the provisions of Section 260533.13, 2 feet minimum, 3 feet maximum for connections to transformer case. Make conduit connections to side panel of enclosure.

E. Arrange equipment to provide minimum clearances as specified on transformer nameplate and in accordance with manufacturer's instructions and NFPA 70.

F. Install transformers plumb and level.

G. Transformer Support:
   1. Provide required support and attachment in accordance with Section 260529, where not furnished by transformer manufacturer.
   2. Mount floor-mounted transformers on properly sized 4 inch (100 mm) high concrete pad constructed in accordance with Section 033000.
   3. Suspended, wall-mounted, and rack-mounted transformers are not allowed without written permission from the University Project Manager prior to.
   4. Use trapeze hangers assembled from threaded rods and metal channel (strut) to support suspended transformers. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
H. Mount floor-mounted transformers on properly sized 4 inch (100 mm) high concrete pad constructed in accordance with Section 033000.
I. Mount floor-mounted transformers using neoprene vibration isolators suitable for isolating the transformer noise from the building structure.
J. Provide grounding and bonding in accordance with Section 260526.
K. Remove shipping braces and adjust bolts that attach the core and coil mounting bracket to the enclosure according to manufacturer's recommendations in order to reduce audible noise transmission.
L. Where not factory-installed, install lugs sized as required for termination of conductors as indicated.
M. Where furnished as a separate accessory, install transformer weathershield per manufacturer's instructions.
N. Identify transformers in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL
A. See Section 014000 - Quality Requirements, for additional requirements.
B. See Section 26 08 00 - Electrical Commissioning Requirements, for additional requirements.
C. Inspect and test in accordance with NETA ATS, except Section 4.
D. Perform inspections and tests listed in NETA ATS Sections 7.2.1.1 and 7.2.1.2. Tests and inspections listed as optional are required.

3.04 ADJUSTING
A. Measure primary and secondary voltages and make appropriate tap adjustments.
B. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING
A. Clean dirt and debris from transformer components according to manufacturer's instructions.
B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 262200
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SECTION 262413
SWITCHBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Low-voltage (600 V and less) switchboards and associated accessories for service and distribution applications.

B. Overcurrent protective devices for switchboards.

1.02 RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Concrete equipment pads.

B. Section 260526 - Grounding and Bonding for Electrical Systems.

C. Section 260529 - Hangers and Supports for Electrical Systems.

D. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

E. Section 260573 - Power System Studies: Additional criteria for the selection and adjustment of equipment and associated protective devices specified in this section.

F. Section 264300 - Surge Protective Devices.

1.03 REFERENCE STANDARDS


B. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.


E. NEMA PB 2 - Deadfront Distribution Switchboards 2011.

F. NEMA PB 2.1 - General Instructions for Proper Handling, Installation, Operation, and Maintenance of Deadfront Distribution Switchboards Rated 1000 Volts or Less 2023.


H. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.


1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances required by NFPA 70.

2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.

3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.

4. Coordinate with manufacturer to provide shipping splits suitable for the dimensional constraints of the installation.

5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

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Switchboards
B. Service Entrance Switchboards:
   1. Coordinate with Utility Company to provide switchboards with suitable provisions for
electrical service and utility metering, where applicable.
   2. Coordinate with Owner to arrange for Utility Company required access to equipment for
installation and maintenance.
   3. Obtain Utility Company approval of switchboard prior to fabrication.
   4. Arrange for inspections necessary to obtain Utility Company approval of installation.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for
switchboards, enclosures, overcurrent protective devices, and other installed components and
accessories.
   1. Include characteristic trip curves for each type and rating of overcurrent protective device.
   2. Submit product data concurrent with study reports.
   3. Do not order equipment until matching study reports and product submittals have both
been evaluated by Architect.
C. Shop Drawings: Indicate dimensions, voltage, bus amperages, overcurrent protective device
arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal
information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of switchboards and adjacent equipment
with all required clearances indicated.
   2. Include wiring diagrams showing all factory and field connections.
   3. Include documentation demonstrating selective coordination.
D. Service Entrance Switchboards: Include documentation of Utility Company approval of
switchboard.
E. Source Quality Control Test Reports: Include reports for tests designated in NEMA PB 2 as
production (routine) tests.
F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use
stipulated by product testing agency. Include instructions for storage, handling, protection,
examination, preparation, and installation of product.
G. Field Quality Control Test Reports.
H. Project Record Documents: Record actual installed locations of switchboards and final
equipment settings.
I. Maintenance Data: Include information on replacement parts and recommended maintenance
procedures and intervals.
J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Enclosure Keys: Six of each different key.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution
requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in
this section with minimum three years documented experience.
D. Product Listing Organization Qualifications: An organization recognized by OSHA as a
Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having
jurisdiction.
1.07 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store switchboards in accordance with manufacturer’s instructions, NECA 400, and NEMA PB 2.1.
B. Store in a clean, dry space having a uniform temperature to prevent condensation (including outdoor switchboards, which are not weatherproof until completely and properly installed). Where necessary, provide temporary enclosure space heaters or temporary power for permanent factory-installed space heaters.
C. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
D. Handle carefully to avoid damage to switchboard internal components, enclosure, and finish.

1.08 FIELD CONDITIONS
A. Maintain field conditions within required service conditions during and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Switchboards - Basis of Design: Schneider Electric; Square D Products: www.schneider-electric.us/#sle.
B. Switchboards - Other Acceptable Manufacturers:
   2. Schneider Electric; Square D Products: www.schneider-electric.us/#sle.
C. Source Limitations: Furnish switchboards and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.02 SWITCHBOARDS
A. Provide switchboards consisting of all required components, control power transformers, instrumentation and control wiring, accessories, etc. as necessary for a complete operating system.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Description: Dead-front switchboard assemblies complying with NEMA PB 2, and listed and labeled as complying with UL 891; ratings, configurations and features as indicated.
D. Front-Connected Switchboards:
   1. Main Device(s): Individually-mounted.
   2. Feeder Devices: Panel/group-mounted.
   3. Arrangement: Front accessible only (not rear accessible), rear aligned.
   4. Compartmentalization: Provide barriered compartments for each vertical section.
E. Service Entrance Switchboards:
   1. Listed and labeled as suitable for use as service equipment according to UL 869A.
   2. For solidly-grounded wye systems, provide factory-installed main bonding jumper between neutral and ground busses, and removable neutral disconnecting link for testing purposes.
   4. Utility Metering Provisions: Provide separate barriered compartment complying with Utility Company requirements where indicated or where required by Utility Company. Include hinged sealable door and provisions for Utility Company current transformers (CTs), potential transformers (PTs), or potential taps as required.
F. Switchboards With Fire Pump Taps: Provide separate bussed vertical section with suitable lugs for fire pump connection to line side of main service disconnect device(s).
G. Service Conditions:
1. Provide switchboards and associated components suitable for operation under the following service conditions without derating:
   a. Altitude: Less than 6,600 feet (2,000 m).
   b. Ambient Temperature:
      1) Switchboards Containing Molded Case or Insulated Case Circuit Breakers: Between 23 degrees F (-5 degrees C) and 104 degrees F (40 degrees C).

H. Short Circuit Current Rating:
   1. Provide switchboards with listed short circuit current rating not less than the available fault current at the installed location as determined by short circuit study performed in accordance with Section 260573.

I. Selectivity: Where the requirement for selectivity is indicated or required by applicable codes, furnish products as required to achieve selective coordination.

J. Main Devices: Configure for top or bottom incoming feed as indicated or as required for the installation. Provide separate pull section and/or top-mounted pullbox as indicated or as required to facilitate installation of incoming feed.

K. Bussing: Sized in accordance with UL 891 temperature rise requirements.
   1. Through bus (horizontal cross bus) to be fully rated through full length of switchboard (non-tapered). Tapered bus is not permitted.
   2. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
   3. Provide solidly bonded equipment ground bus through full length of switchboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
   4. Phase and Neutral Bus Material: Copper.
   5. Ground Bus Material: Copper.

L. Conductor Terminations: Suitable for use with the conductors to be installed.
   1. Line Conductor Terminations:
      a. Main and Neutral Lug Material: Suitable for use with the conductors to be installed.
      b. Main and Neutral Lug Type: Compression.
   2. Load Conductor Terminations:
      a. Lug Material: Suitable for use with the conductors to be installed.
      b. Lug Type:
         1) Provide mechanical lugs unless otherwise indicated.
         2) Provide compression lugs where indicated.

M. Enclosures:
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1 or Type 2 (drip-proof).
   2. Finish: Manufacturer's standard unless otherwise indicated.

N. Future Provisions:
   1. Prepare designated spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.
   2. Equip distribution sections with full height vertical bussing to accommodate maximum utilization of space for devices.
   3. Arrange and equip through bus and ground bus to accommodate future installation of additional switchboard sections.

O. Ground Fault Protection: Where ground-fault protection is indicated, provide system listed and labeled as complying with UL 1053.
   1. Where overcurrent protective devices equipped with integral ground fault protection are used, provide separate neutral current sensor where applicable.
   2. Where accessory ground fault sensing and relaying equipment is used, equip companion overcurrent protective devices with ground-fault shunt trips.
a. Use zero sequence or residual ground fault detection method unless otherwise indicated.
b. Provide test panel and field-adjustable ground fault pick-up and delay settings.
c. Provide zone selective interlocking capability where indicated, capable of communicating with other electronic trip circuit breakers and external ground fault sensing systems to control ground fault delay functions for system coordination purposes.

P. Arc Flash Energy-Reducing Maintenance Switching: For circuit breakers rated 1200 A or higher, provide a local accessory switch with status indicator light that permits selection of a maintenance mode with alternate electronic trip unit settings for reduced fault clearing time.

Q. Basic Owner Metering:
1. Provide microprocessor-based digital electrical metering system including all instrument transformers, wiring, and connections necessary for measurements specified.
3. Measured Parameters:
   a. Voltage (Volts AC): Line-to-line, line-to-neutral for each phase.
   b. Current (Amps): For each phase and neutral.
   c. Frequency (Hz).
   d. Real power (kW): For each phase, 3-phase total.
   e. Reactive power (kVAR): For each phase, 3-phase total.
   f. Apparent power (kVA): For each phase, 3-phase total.
   g. Power factor.
h. Real energy (kWh).
i. Reactive energy (kVARh).
j. Apparent energy (kVArh).
k. Current demand.
l. Power demand: Real, reactive, and apparent.
4. Meter Accuracy: Plus/minus 0.5 percent.
5. Features:
   b. Make connections to owner's equipment according to owner representative's direction. Test to verify proper connection and operations.
   c. Remote monitoring capability via PC.

R. Instrument Transformers:
2. Select suitable ratio, burden, and accuracy as required for connected devices.

2.03 OVERCURRENT PROTECTIVE DEVICES
A. Circuit Breakers:
1. Interrupting Capacity:
   a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than specified minimum requirements.
   b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
2. Molded Case Circuit Breakers:
   a. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers; listed and labeled as complying with UL 489; ratings, configurations, and features as indicated.
      1) Provide thermal magnetic circuit breakers for circuit breaker frame sizes less than 250 amperes unless otherwise noted.
2) Provide electronic trip circuit breakers for circuit breaker frame sizes 250 amperes and above and as indicated.
   a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated.
   b. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
      1) Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 225 amperes and larger.
      2) Provide interchangeable trip units for circuit breaker frame sizes 225 amperes and larger.
   c. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
      1) Provide the following field-adjustable trip response settings:
         (a) Long time pickup, adjustable by replacing interchangeable trip unit or by setting dial.
         (b) Long time delay.
         (c) Short time pickup and delay.
         (d) Instantaneous pickup.
         (e) Ground fault pickup and delay where ground fault protection is indicated.
   d. Provide zone selective interlocking capability where indicated, capable of communicating with other electronic trip circuit breakers and external ground fault sensing systems to control short time delay and ground fault delay functions for system coordination purposes.
   e. Provide communication capability where indicated: Compatible with system indicated.
   f. Provide the following circuit breaker types where indicated:
      1) 100 Percent Rated Circuit Breakers: Listed for application within the switchboard where installed at 100 percent of the continuous current rating.
   g. Provide the following features and accessories where indicated or where required to complete installation:
      1) Shunt Trip: Provide coil voltage as required for connection to indicated trip actuator.
      2) Pad-Lock Provision: For locking circuit breaker handle in OFF position.
      3) Auxiliary Switch: SPDT switch suitable for connection to system indicated for indicating when circuit breaker has tripped or been turned off.

2.04 SOURCE QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Factory test switchboards according to NEMA PB 2, including the following production (routine) tests on each switchboard assembly or component:
      1. Dielectric tests.
      2. Mechanical operation tests.
      3. Grounding of instrument transformer cases test.
      4. Electrical operation and control wiring tests, including polarity and sequence tests.
      5. Ground-fault sensing equipment test.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that the ratings and configurations of the switchboards and associated components are consistent with the indicated requirements.
   B. Verify that mounting surfaces are ready to receive switchboards.
   C. Verify that conditions are satisfactory for installation prior to starting work.
3.02 INSTALLATION
   A. Install products in accordance with manufacturer's instructions.
   B. Install switchboards in accordance with NECA 1 (general workmanship), NECA 400, and NEMA PB 2.1.
   C. Arrange equipment to provide required clearances and maintenance access, including accommodations for any drawout devices.
   D. Where switchboard is indicated to be mounted with inaccessible side against wall, provide minimum clearance of 2 inches (50 mm) between switchboard and wall.
   E. Provide required support and attachment components in accordance with Section 260529.
   F. Install switchboards plumb and level.
   G. Unless otherwise indicated, mount switchboards on properly sized 4 inch (100 mm) high concrete pad constructed in accordance with Section 033000.
   H. Provide grounding and bonding in accordance with Section 260526.
   I. Install all field-installed devices, components, and accessories.
   J. Where accessories are not self-powered, provide control power source as indicated or as required to complete installation.
   K. Set field-adjustable circuit breaker tripping function settings as determined by overcurrent protective device coordination study performed in accordance with Section 260573.
   L. Provide filler plates to cover unused spaces in switchboards.
   M. Identify switchboards in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Provide services of a manufacturer's authorized representative to observe installation and assist in inspection and testing. Include manufacturer's reports with submittals.
   C. Disconnect surge protective devices (SPDs) prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPDs connected.
   D. Before energizing switchboard, perform insulation resistance testing in accordance with NECA 400 and NEMA PB 2.1.
   E. Inspect and test in accordance with NETA ATS, except Section 4.
   F. Perform inspections and tests listed in NETA ATS, Section 7.1.
   G. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1 for all main circuit breakers and circuit breakers larger than 125 amperes. Tests listed as optional are not required, except for the following:
      1. Test functions of the trip unit by means of secondary injection.
   H. Ground Fault Protection Systems: Test in accordance with manufacturer's instructions as required by NFPA 70.
      1. Perform inspections and tests listed in NETA ATS, Section 7.14. The insulation-resistance test on control wiring listed as optional is not required.
   I. Meters: Perform inspections and tests listed in NETA ATS, Section 7.11.2.
   J. Test shunt trips to verify proper operation.
   K. Correct deficiencies and replace damaged or defective switchboards or associated components.
   L. Submit detailed reports indicating inspection and testing results and corrective actions taken.

3.04 ADJUSTING
   A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.
B. Adjust alignment of switchboard covers and doors.

3.05 CLEANING
A. Clean dirt and debris from switchboard enclosures and components according to manufacturer's instructions.
B. Repair scratched or marred surfaces to match original factory finish.

3.06 CLOSEOUT ACTIVITIES
A. See Section 017800 - Closeout Submittals, for closeout submittals.
B. See Section 017900 - Demonstration and Training, for additional requirements.
C. Training: Train Owner's personnel on operation, adjustment, and maintenance of switchboard and associated devices.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide for a minimum of two sessions with two hours of training at each session.
   3. Instructor: Manufacturer's authorized representative.
   4. Location: At project site.
   5. Each training session will include a sign-in sheet for personnel attending and the attendance sheet will be included with the O&Ms.

3.07 PROTECTION
A. Protect installed switchboards from subsequent construction operations.

END OF SECTION 262413
SECTION 262416
PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Power distribution panelboards.
B. Lighting and appliance panelboards.
C. Overcurrent protective devices for panelboards.

1.02 RELATED REQUIREMENTS

A. Section 253613 - Integrated Automation Power Meters: Smart (AMI and AMR) Meters.
B. Section 260526 - Grounding and Bonding for Electrical Systems.
C. Section 260526 - Grounding and Bonding for Electrical Systems.
D. Section 260529 - Hangers and Supports for Electrical Systems.
E. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
F. Section 260573 - Power System Studies: Additional criteria for the selection and adjustment of equipment and associated protective devices specified in this section.
G. Section 26 08 00 - Electrical Commissioning Requirements: Additional requirements for Commissioning.
H. Section 262200 - Low-Voltage Transformers: Small power centers with integral primary breaker, transformer, and panelboard.
I. Section 262813 - Fuses: Fuses for fusible switches and spare fuse cabinets.
J. Section 264300 - Surge Protective Devices.

1.03 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service 2013e, with Amendment (2017).
B. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
E. NEMA PB 1 - Panelboards 2011.
F. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 1000 Volts or Less 2023.
H. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment,
      or other potential obstructions within the dedicated equipment spaces and working
      clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance
      requirements of the actual equipment to be installed.
   3. Coordinate the work with other trades to provide walls suitable for installation of flush-
      mounted panelboards where indicated.
   4. Verify with manufacturer that conductor terminations are suitable for use with the
      conductors to be installed.
   5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain
      direction before proceeding with work.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for
   panelboards, enclosures, overcurrent protective devices, and other installed components and
   accessories.
   1. Include characteristic trip curves for each type and rating of overcurrent protective device.
   2. Submit product data concurrent with Section 26 05 73 - Power System Studies reports
      and with product data for Section 26 24 13 - Switchboards.
   3. Do not order equipment until matching reports and product submittals have both been
      evaluated by the Engineer.

C. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity,
   overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry
   locations, conductor terminal information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of panelboards and adjacent equipment
      with all required clearances indicated.
   2. Include wiring diagrams showing all factory and field connections.

D. Coordination drawings: provide scaled drawings of electrical rooms and panelboard locations,
   with existing and new proposed equipment shown. Scale shall be 1/4" = 1'-0". Drawings shall
   show compliance with NEC required clearances, working spaces, and equipment spaces.
   Include relevant portions of all building systems, including those of other trades.

E. Field Quality Control Test Reports.

F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use
   stipulated by product testing agency. Include instructions for storage, handling, protection,
   examination, preparation, and installation of product.
   1. Include instructions for adjusting overcurrent protective devices and other component
      settings.

G. Panelboard Schedules: Furnish the following:
   1. Typewritten circuit directories, updated after load balancing,
   2. MS Word or MS Excel final versions, saved on a USB flash drive.

H. Project Record Documents: Record actual installed locations of panelboards and actual
   installed circuiting arrangements.

I. Maintenance Data: Include information on replacement parts and recommended maintenance
   procedures and intervals.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Overcurrent Protection Devices: Instructions for testing and adjusting.
   2. See Section 016000 - Product Requirements, for additional provisions.
   3. Panelboard Keys: Six of each different key.
   4. Touch-up Paint: One pint.
1.06 QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.
   B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.
   B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
   C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   B. Substitutions: See Section 016000 - Product Requirements.
   C. Source Limitations: Furnish panelboards and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.02 PANELBOARDS - GENERAL REQUIREMENTS
   A. Provide products listed, classified, and labeled as suitable for the purpose intended.
   B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
      1. Altitude: Less than 6,600 feet (2,000 m).
      2. Ambient Temperature:
         a. Panelboards Containing Circuit Breakers: Between 23 degrees F (-5 degrees C) and 104 degrees F (40 degrees C).
   C. Short Circuit Current Rating:
      1. Provide panelboards with listed short circuit current rating not less than the available fault current at the installed location as determined by short circuit study performed in accordance with Section 260573.
   D. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.
   E. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.
   F. Bussing: Sized in accordance with UL 67 temperature rise requirements.
      1. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
      2. Provide 200 percent rated neutral bus and lugs where indicated, where oversized neutral conductors are provided, or where panelboards are fed from K-rated transformers.
      3. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
   G. Conductor Terminations: Suitable for use with the conductors to be installed.
   H. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
      1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
         a. Indoor Clean, Dry Locations: Type 1.
      2. Boxes: Galvanized steel unless otherwise indicated.
         a. Provide wiring gutters sized to accommodate the conductors to be installed.
b. Increase gutter space as required where sub-feed lugs, feed-through lugs, gutter taps, or oversized lugs are provided.

3. Fronts:
   a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
   b. Fronts for Flush-Mounted Enclosures: Overlap boxes on all sides to conceal rough opening.
   c. Fronts: Provide door-in-door trim with hinged cover for access to load terminals and wiring gutters, and separate lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts. Panelboard front shall comply with University Standard. Panelboard Cover Drawing available at https://www.colorado.edu/facilities/planning-design-construction/design-construction/design-construction-standards
   d. Finish for Painted Steel Fronts: Manufacturer's standard grey unless otherwise indicated.

4. Lockable Doors: All locks keyed alike unless otherwise indicated.

I. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.

J. Ground Fault Protection: Where ground-fault protection is indicated, provide system listed and labeled as complying with UL 1053.
   1. Where electronic circuit breakers equipped with integral ground fault protection are used, provide separate neutral current sensor where applicable.

K. Selectivity: Where the requirement for selectivity is indicated or a requirement of applicable codes, furnish products as required to achieve selective coordination.

L. Multi-Section Panelboards: Provide enclosures of the same height, with feed-through lugs and feeders as indicated or as required to interconnect sections.
   1. Provide feed-through lugs where a multi-section panelboard includes a single main circuit breaker.

M. Owner Metering:
   1. Provide microprocessor-based digital electrical metering system including all instrument transformers, wiring, and connections necessary for measurements specified.
   2. Manufacturer:
      a. General Electric - AMP1 Power & Energy Meter
   3. Measured Parameters:
      a. Voltage (Volts AC): Line-to-line, line-to-neutral for each phase.
      b. Current (Amps): For each phase and neutral.
      c. Frequency (Hz).
      d. Real power (kW): For each phase, 3-phase total.
      e. Reactive power (kVAR): For each phase, 3-phase total.
      f. Apparent power (kVA): For each phase, 3-phase total.
      g. Power factor,
      h. Real energy (kWh).
   4. Meter Accuracy: Plus/minus 0.5 percent.
   5. Features:
      b. Make connections to owner's equipment according to owner's representative's direction. Test to verify proper connection and operations
      c. Remote monitoring capability via PC.

N. Load centers are not acceptable.

O. Provide the following features and accessories where indicated or where required to complete installation:
   1. Feed-through lugs.
2.03 POWER DISTRIBUTION PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, power and feeder distribution type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated.

B. Products:

C. Conductor Terminations:
   1. Main and Neutral Lug Material: Suitable for use with the conductors to be installed.
   2. Main and Neutral Lug Type: Mechanical.

D. Bussing:
   1. Phase and Neutral Bus Material: Copper.
   2. Ground Bus Material: Copper.

E. Circuit Breakers:
   1. Provide bolt-on type or plug-in type secured with locking mechanical restraints.
   2. Provide thermal magnetic circuit breakers for circuit breaker frame sizes less than 225 amperes.
   3. Provide electronic trip circuit breakers for circuit breaker frame sizes 225 amperes and above.

F. Enclosures:
   1. Provide surface-mounted enclosures unless otherwise indicated.
   2. Fronts: Provide door-in-door trim with hinged cover for access to load terminals and wiring gutters, and separate lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts. Panelboard front shall comply with University Standard. Panelboard Cover Drawing available at https://www.colorado.edu/fm/divisions/planning-design-construction/design-construction/design-construction-standards
   3. Provide clear plastic circuit directory holder mounted on inside of door.

G. Owner Metering:
   1. Provide microprocessor-based digital electrical metering system including all instrument transformers, wiring, and connections necessary for measurements specified.
   2. Manufacturer:
      a. Where bussing of board is 800A or less, utilize General Electric - AMP1 Power & Energy Meter
      b. Where bussing of board is above 800A, utilize Electro Industries, Inc.: Shark - model 100S-60-10-V3.
   3. Measured Parameters:
      a. Voltage (Volts AC): Line-to-line, line-to-neutral for each phase.
      b. Current (Amps): For each phase and neutral.
      c. Frequency (Hz).
      d. Real power (kW): For each phase, 3-phase total.
      e. Reactive power (kVAR): For each phase, 3-phase total.
      f. Apparent power (kVA): For each phase, 3-phase total.
      g. Power factor.
      h. Real energy (kWh).
   4. Meter Accuracy: Plus/minus 0.5 percent.
   5. Features:
      b. Make connections to owner's equipment according to owner's representative's direction. Test to verify proper connection and operations

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Panelboards
c. Remote monitoring capability via PC.

2.04 LIGHTING AND APPLIANCE PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated.

B. Products:
   1. 480/277V Basis of Design: General Electric.
   2. 208/120V Basis of Design: General Electric.

C. Conductor Terminations:
   1. Main and Neutral Lug Material: Suitable for use with the conductors to be installed.
   2. Main and Neutral Lug Type: Mechanical.

D. Bussing:
   2. Phase and Neutral Bus Material: Copper.

E. Circuit Breakers: Thermal magnetic bolt-on type.

F. Enclosures:
   1. Provide surface-mounted or flush-mounted enclosures as indicated.
   2. Fronts: Provide door-in-door trim with hinged cover for access to load terminals and wiring guts, and separate lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts. Panelboard Cover Drawing available at https://www.colorado.edu/fm/divisions/planning-design-construction/design-construction/design-construction-standards
   3. Provide clear plastic circuit directory holder mounted on inside of door.

G. Owner Metering:
   1. Provide microprocessor-based digital electrical metering system including all instrument transformers, wiring, and connections necessary for measurements specified.
   2. Manufacturer:
      a. General Electric - AMP1 Power & Energy Meter
   3. Measured Parameters:
      a. Voltage (Volts AC): Line-to-line, line-to-neutral for each phase.
      b. Current (Amps): For each phase and neutral.
      c. Frequency (Hz).
      d. Real power (kW): For each phase, 3-phase total.
      e. Reactive power (kVAR): For each phase, 3-phase total.
      f. Apparent power (kVA): For each phase, 3-phase total.
      g. Power factor.
      h. Real energy (kWh).
   4. Meter Accuracy: Plus/minus 0.5 percent.
   5. Features:
      b. Make connections to owner's equipment according to owner's representative's direction. Test to verify proper connection and operations
      c. Remote monitoring capability via PC.

2.05 OVERCURRENT PROTECTIVE DEVICES

A. Molded Case Circuit Breakers:
1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489; ratings, configurations, and features as indicated.
   a. Provide thermal magnetic circuit breakers for circuit breaker frame sizes less than 225 amperes.
   b. Provide electronic trip circuit breakers for circuit breaker frame sizes 225 amperes and above.
   c. Circuit breakers shall be bolt-on type.
2. Interrupting Capacity:
   a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated.
   b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
3. Conductor Terminations:
   a. Provide mechanical lugs unless otherwise indicated.
   b. Provide compression lugs where indicated.
   c. Lug Material: Suitable for use with the conductors to be installed.
4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
   a. Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 225 amperes and larger.
   b. Provide interchangeable trip units for circuit breaker frame sizes 225 amperes and larger.
5. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
   a. Provide the following field-adjustable trip response settings:
      1) Long time pickup, adjustable by replacing interchangeable trip unit or by setting dial.
      2) Long time delay.
      3) Short time pickup and delay.
      4) Instantaneous pickup.
      5) Ground fault pickup and delay where ground fault protection is indicated.
   b. Provide zone selective interlocking capability where indicated, capable of communicating with other electronic trip circuit breakers and external ground fault sensing systems to control short time delay and ground fault delay functions for system coordination purposes.
8. Provide the following circuit breaker types where indicated:
   a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
   b. Ground Fault Equipment Protection Circuit Breakers: Designed to trip at 30 mA for protection of equipment.
   c. 100 Percent Rated Circuit Breakers: Listed for application within the panelboard where installed at 100 percent of the continuous current rating.
9. Do not use tandem circuit breakers.
10. Do not use handle ties in lieu of multi-pole circuit breakers.
11. Provide multi-pole circuit breakers for multi-wire branch circuits as required by NFPA 70.
12. Provide the following features and accessories where indicated or where required to complete installation:
   a. Shunt Trip: Provide coil voltage as required for connection to indicated trip actuator.
   b. Handle Pad-Lock Provision: For locking circuit breaker handle in OFF position.
2.06 EXISTING CONDITIONS AND COMPONENTS
   A. For modifications to existing equipment, provide components compatible with the existing equipment.
   B. Perform a survey of existing equipment prior to starting work.
      1. Document any non-functional equipment or components.
      2. Do not interrupt power service or equipment serving occupied facilities unless permitted under the following conditions and then only after arranging to provide temporary services:
         a. Notify Architect at least 7 days in advance of proposed interruption of service or equipment.
         b. Do not proceed with interruption of service or equipment without Architect written permission.
   C. Expand, modify, and supplement existing equipment to complete the work.
   D. Remove existing equipment completely after new system is fully operational. Maintain existing equipment fully operational until new system has been tested and accepted.

2.07 SOURCE QUALITY CONTROL
   A. Factory test panelboards according to NEMA PB 1.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.
   B. Verify that mounting surfaces are ready to receive panelboards.
   C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Perform work in accordance with NECA 1 (general workmanship).
   B. Install products in accordance with manufacturer's instructions.
   C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.
   D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
   E. Provide required supports in accordance with Section 260529.
   F. Install panelboards plumb.
   G. Install flush-mounted panelboards so that trims fit completely flush to wall with no gaps and rough opening completely covered.
   H. Provide minimum of five (5) spare 1 inch (27 mm) trade size conduits out of each flush-mounted panelboard stubbed into accessible space above ceiling.
   I. Provide grounding and bonding in accordance with Section 260526.
      1. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on isolated/insulated ground bus.
   J. Multi-Wire Branch Circuits: Group grounded and ungrounded conductors together in the panelboard as required by NFPA 70.
   K. Set field-adjustable ground fault protection pickup and time delay settings as indicated.
   L. Provide filler plates to cover unused spaces in panelboards.
   M. Provide circuit breaker lock-on devices to prevent unauthorized personnel from de-energizing essential loads where indicated. Also provide for the following:
      1. Emergency and night lighting circuits.
      2. Fire detection and alarm circuits.
   N. Identify panelboards in accordance with Section 260553. Relabel panel boards as noted on the drawings. Where panel boards are relabeled, include relabeling of branch circuit and
associated equipment labels.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.
B. See Section 26 08 00 - Electrical Commissioning Requirements, for additional requirements.
C. Inspect and test in accordance with NETA ATS, except Section 4.
D. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1 for all main circuit breakers and circuit breakers larger than 200 amperes. Tests listed as optional are not required, except for the following:
   1. Test functions of the trip unit by means of secondary injection.
E. Ground Fault Protection Systems: Test in accordance with manufacturer's instructions as required by NFPA 70.
   1. Perform inspections and tests listed in NETA ATS, Section 7.14. The insulation-resistance test on control wiring listed as optional is not required.
F. Test GFCI circuit breakers to verify proper operation.
G. Test shunt trips to verify proper operation.
H. Test integrated metering system on each individual panel utilizing a test load to verify all three phases, neutral and ground. Existing branch circuit(s) may not be utilized for the test load and may not be connected to the panelboard until the metering system has been tested.
I. Procure services of a qualified manufacturer's representative to observe installation and assist in inspection, testing, and adjusting. Include manufacturer's reports with field quality control submittals.
J. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.04 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.
B. Adjust alignment of panelboard fronts.
C. Load Balancing: For each panelboard, rearrange circuits such that the difference between each measured steady state phase load does not exceed 20 percent and adjust circuit directories accordingly. Maintain proper phasing for multi-wire branch circuits.

3.05 CLEANING

A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.
B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 262416
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SECTION 262813
FUSES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Fuses.

1.02 RELATED REQUIREMENTS
A. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
B. Section 260573 - Power System Studies: Additional criteria for the selection of protective devices specified in this section.
C. Section 262816.16 - Enclosed Switches: Fusible switches.

1.03 REFERENCE STANDARDS
A. NEMA FU 1 - Low Voltage Cartridge Fuses 2012.
B. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate fuse clips furnished in equipment provided under other sections for compatibility with indicated fuses.
      a. Fusible Enclosed Switches: See Section 262816.16.
   2. Coordinate fuse requirements according to manufacturer's recommendations and nameplate data for actual equipment to be installed.
   3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard data sheets including voltage and current ratings, interrupting ratings, time-current curves, and current limitation curves.
C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Fuses: One set(s) of three for each type and size installed.
   3. Fuse Pullers: One set(s) compatible with each type and size installed.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.01 MANUFACTURERS
D. Source Limitations: Furnish fuses produced by a single manufacturer and obtained from a single supplier.

2.02 APPLICATIONS
A. Distribution Equipment Feeders and Branch Circuits:
   1. Fusible Switches up to 600 Amperes: Class RK1, time-delay.
   2. Fusible Switches Larger Than 600 Amperes: Class L, time-delay.
B. Fused Switches at Termination of Motor Branch Circuits: Class RK5, time-delay.

2.03 FUSES
A. Provide products listed, classified, and labeled as suitable for the purpose intended.
B. Unless specifically indicated to be excluded, provide fuses for all fusible equipment as required for a complete operating system.
C. Provide fuses of the same type, rating, and manufacturer within the same switch.
D. Comply with UL 248-1.
E. Unless otherwise indicated, provide cartridge type fuses complying with NEMA FU 1, Class and ratings as indicated.
F. Voltage Rating: Suitable for circuit voltage.
G. Class R Fuses: Comply with UL 248-12.
I. Class L Fuses: Comply with UL 248-10.
J. Selectivity: Where the requirement for selectivity is indicated or a requirement of applicable codes, furnish products as required to achieve selective coordination.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that fuse ratings are consistent with circuit voltage and manufacturer's recommendations and nameplate data for equipment.
B. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
A. Do not install fuses until circuits are ready to be energized.
B. Install fuses with label oriented such that manufacturer, type, and size are easily read.

END OF SECTION 262813
SECTION 262816.16
ENCLOSED SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Enclosed safety switches.

1.02 RELATED REQUIREMENTS
A. Section 260526 - Grounding and Bonding for Electrical Systems.
B. Section 260529 - Hangers and Supports for Electrical Systems.
C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
D. Section 260573 - Power System Studies: Additional criteria for the selection of equipment and associated protective devices specified in this section.
E. Section 26 08 00 - Electrical Commissioning Requirements: Additional requirements for Commissioning.
F. Section 262813 - Fuses.
G. Section 262913 - Enclosed Controllers: Manual motor controllers.

1.03 REFERENCE STANDARDS
A. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
C. NEMA KS 1 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum) 2013.
E. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate the work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
   4. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for enclosed switches and other installed components and accessories.
   1. Submit product data concurrent with study reports.
   2. Do not order equipment until matching study reports and product submittals have both been evaluated by Architect.
C. Shop Drawings: Indicate outline and support point dimensions, voltage and current ratings, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
   1. Include dimensioned plan and elevation views of enclosed switches and adjacent equipment with all required clearances indicated.
   2. Include wiring diagrams showing all factory and field connections.

D. Field Quality Control Test Reports.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

F. Project Record Documents: Record actual locations of enclosed switches.

G. Maintenance Data: Include information on replacement parts and recommended maintenance procedures and intervals.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. See Section 262813 for requirements for spare fuses and spare fuse cabinets.

1.06 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed switch internal components, enclosure, and finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS


C. Schneider Electric; Square D Products: www.schneider-electric.us.


E. Source Limitations: Furnish enclosed switches and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.02 ENCLOSED SAFETY SWITCHES

A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet (2,000 m).
   2. Ambient Temperature: Between -22 degrees F (-30 degrees C) and 104 degrees F (40 degrees C).

D. Horsepower Rating: Suitable for connected load.

E. Voltage Rating: Suitable for circuit voltage.

F. Short Circuit Current Rating:
1. Provide enclosed safety switches, when protected by the fuses or supply side overcurrent protective devices to be installed, with listed short circuit current rating as indicated.
2. Minimum Ratings:
   a. Heavy Duty Single Throw Switches Protected by Class R, Class J, or Class L Fuses:  
      200,000 rms symmetrical amperes.
   b. Heavy Duty Single Throw Switches without Fuses: 10,000 rms symmetrical amperes.

G. Provide with switch blade contact position that is visible when the cover is open.

H. Fuse Clips for Fusible Switches: As required to accept fuses indicated.
1. Where NEMA Class R fuses are installed, provide rejection feature to prevent installation of fuses other than Class R.

I. Conductor Terminations: Suitable for use with the conductors to be installed.

J. Provide insulated, groundable fully rated solid neutral assembly where a neutral connection is required, with a suitable lug for terminating each neutral conductor.

K. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.

L. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
   a. Indoor Clean, Dry Locations: Type 1.
2. Finish for Painted Steel Enclosures: Campus standard color unless otherwise indicated.

M. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

N. Heavy Duty Switches:
2. Conductor Terminations:
   a. Provide mechanical lugs unless otherwise indicated.
   b. Provide compression lugs where indicated.
   c. Lug Material: Suitable for use with the conductors to be installed.
3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.
   a. Provide means for locking handle in the ON position where indicated.

O. Provide the following features and accessories where indicated or where required to complete installation:
1. Auxiliary Switch: SPDT switch suitable for connection to system indicated, with auxiliary contact operation before switch blades open and after switch blades close.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.
B. Verify that mounting surfaces are ready to receive enclosed safety switches.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
D. Provide required supports in accordance with Section 260529.
E. Install enclosed switches plumb.
F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches (2000 mm) above the floor or working platform.

G. Provide grounding and bonding in accordance with Section 260526.

H. Provide fuses complying with Section 262813 for fusible switches as indicated or as required by equipment manufacturer’s recommendations.

I. Identify enclosed switches in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. See Section 26 08 00 - Electrical Commissioning Requirements, for additional requirements.

C. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.

D. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

3.04 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer’s recommended torque settings.

3.05 CLEANING

A. Clean dirt and debris from switch enclosures and components according to manufacturer’s instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 262816.16
SECTION 264300
SURGE PROTECTIVE DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Surge protective devices for service entrance locations.
B. Surge protective devices for distribution locations.
C. Surge protective devices for branch panelboard locations.
D. Surge protective devices for NFPA 70 Emergency Systems distribution locations.

1.02 RELATED REQUIREMENTS
A. Section 260526 - Grounding and Bonding for Electrical Systems.
B. Section 262413 - Switchboards.
C. Section 262416 - Panelboards.

1.03 ABBREVIATIONS AND ACRONYMS
B. SPD: Surge Protective Device.

1.04 REFERENCE STANDARDS
B. NECA 1 - Standard for Good Workmanship in Electrical Construction 2015.
E. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.05 ADMINISTRATIVE REQUIREMENTS
A. Coordination: Coordinate size and location of overcurrent device compatible with the actual surge protective device and location to be installed, and in accordance with manufacturer's written instructions. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to ordering equipment.

1.06 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Include detailed component information, voltage, surge current ratings, repetitive surge current capacity, voltage protection rating (VPR) for all protection modes, maximum continuous operating voltage (MCOV), nominal discharge current (I-n), short circuit current rating (SCCR), connection means including any required external overcurrent protection, enclosure ratings, outline and support point dimensions, weight, service condition requirements, and installed features.
   1. SPDs with EMI/RFI filter: Include noise attenuation performance.
C. Certificates: Manufacturer's documentation of listing and labeling to the latest versions of the following standards:
   1. UL 1449 (for Type 1 and Type 2 SPDs).
   2. UL 1283 (for Type 2 SPDs).
D. Compliance Form: Manufacturer's checklist and certification that products meet or exceed specified requirements.

Surge Protective Devices
E. Certified Prototype Test Reports: Single pulse current test.
F. Field Quality Control Test Reports.
G. Manufacturer's Installation Instructions: Include application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
H. Operation and Maintenance Data: Include information on status indicators and recommended maintenance procedures and intervals.
I. Project Record Documents: Record actual connections and locations of surge protective devices.

1.07 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
D. Product Listing Organization Qualifications: Product shall bear a UL label.

1.08 DELIVERY, STORAGE, AND PROTECTION
A. Store in a clean, dry space in accordance with manufacturer's written instructions.

1.09 FIELD CONDITIONS
A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.10 WARRANTY
A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
B. Manufacturer's Warranty: Provide minimum ten year warranty covering repair or replacement of surge protective devices showing evidence of failure due to:
   1. Acts of nature, including lightning and other surge events.
   2. Defective materials or workmanship.
C. Exclude surge protective devices from any clause limiting warranty responsibility for acts of nature, including lightning, stated elsewhere.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Field-installed, Externally Mounted Surge Protective Devices:
B. Substitutions: See Section 016000 - Product Requirements. Submit completed University "SPD Submittal Compliance Form" for review by Engineer of Record and University Project Manager. Form can be found in the current University Facility Standards.
C. Source Limitations: Furnish surge protective devices produced by a single manufacturer and obtained from a single supplier.

2.02 SURGE PROTECTIVE DEVICES - GENERAL REQUIREMENTS
A. Description: Factory-assembled surge protective devices (SPDs) for 60 Hz service; UL listed, classified, and labeled as suitable for the purpose intended; system voltage as indicated on the drawings.
B. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.
C. Protected Modes:
2. Delta Systems: L-G, L-L.

D. UL 1449 Voltage Protection Ratings (VPRs):
   1. 208Y/120V System Voltage: Not more than 1,000 V for L-N, L-G, and N-G modes and 1,200 V for L-L mode.
   2. 480Y/277V System Voltage: Not more than 1,500 V for L-N, L-G, and N-G modes and 2,000 V for L-L mode.

E. UL 1449 Maximum Continuous Operating Voltage (MCOV): Not less than 115% of nominal system voltage.

F. Enclosure Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
   1. Indoor clean, dry locations: NEMA Enclosure Type 4 or Type 12.

G. Mounting for Field-installed, Externally Mounted SPDs: Unless otherwise indicated, as specified for the following locations:
   1. Provide surface-mounted SPD where mounted in non-public areas or adjacent to surface-mounted equipment.

2.03 SURGE PROTECTIVE DEVICES FOR SERVICE ENTRANCE LOCATIONS

A. Surge Protective Device:
   1. Protection Circuits: Field-replaceable modular or non-modular.
   2. Surge Current Rating: Not less than 120 kA per mode/240 kA per phase.
   3. UL 1449 Nominal Discharge Current (I-n): 20 kA.
   4. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
   5. Diagnostics:
      a. Protection Status Monitoring: Provide indicator lights to report the protection for each phase.
      b. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.
      c. Surge Counter: Provide surge event counter with manual reset button, surge count retention upon power loss, and six digit LCD display that indicates quantity of surge events.

B. Unless otherwise indicated, provide field-installed, externally mounted SPDs.

C. Provide SPDs utilizing only field-replaceable modular protection circuits.

D. Surge Current Rating: Not less than 150 kA per mode/300 kA per phase.

E. Repetitive Surge Current Capacity: Not less than 5,000 impulses per mode/10,000 impulses per phase.

F. UL 1449 Short Circuit Current Rating (SCCR): Not less than 200 kA.

G. EMI/RFI Filtering: Provide EMI/RFI filter to attenuate electrical noise; listed as complying with UL 1283 for Type 2 SPDs (UL 1283 listing not available for Type 1 SPDs).
   1. Noise Attenuation: Not less than 40 dB at 100 kHz using MIL-STD-220 insertion loss test method.

H. Diagnostics:
   1. Remote Status Monitoring: Provide Form C dry type contacts (normally open and normally closed) for remote annunciation of status.
   2. Surge Counter: Provide surge event counter with manual reset button, surge count retention upon power loss, and LCD display that indicates quantity and level of surge events (low, medium, and high levels).

2.04 SURGE PROTECTIVE DEVICES FOR DISTRIBUTION LOCATIONS

A. Model #SL2-150 or approved equal.
B. Model Distribution locations include SPDs connected to distribution panelboards and switchboards.

C. Surge Protective Device:
   1. Protection Circuits: Field-replaceable modular or non-modular.
   2. Surge Current Rating: Not less than 80 kA per mode/160 kA per phase.
   3. UL 1449 Nominal Discharge Current (I-n): 20 kA.
   4. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
   5. Diagnostics:
      a. Protection Status Monitoring: Provide indicator lights to report the protection status for each phase.
      b. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.

D. Unless otherwise indicated, provide field-installed, externally mounted SPDs.

E. List and label as complying with UL 1449, Type 1 or Type 2.

F. Distribution locations include SPDs connected to distribution panelboards.

G. Provide SPDs utilizing field-replaceable modular or non-modular protection circuits.

H. Surge Current Rating: Not less than 100 kA per mode/200 kA per phase.

I. Repetitive Surge Current Capacity: Not less than 5,000 impulses per mode/10,000 impulses per phase.

J. UL 1449 Nominal Discharge Current (I-n): 20 kA.

K. UL 1449 Short Circuit Current Rating (SCCR): Not less than 200 kA.

L. EMI/RFI Filtering: Provide EMI/RFI filter to attenuate electrical noise; listed as complying with UL 1283 for Type 2 SPDs (UL 1283 listing not available for Type 1 SPDs).
   1. Noise Attenuation: Not less than 40 dB at 100 kHz using MIL-STD-220 insertion loss test method.

M. Diagnostics:
   1. Protection Status Monitoring: Provide indicator lights to report the protection status for each phase.
   3. Remote Status Monitoring: Provide Form C dry type contacts (normally open and normally closed) for remote annunciation of status.
   4. Surge Counter: Provide surge event counter with manual reset button, surge count retention upon power loss, and LCD display that indicates quantity and level of surge events (low, medium, and high levels).

N. Provide integral fused disconnect.

2.05 SURGE PROTECTIVE DEVICES FOR BRANCH PANELBOARD LOCATIONS

A. Surge Protective Device:
   1. Protection Circuits: Field-replaceable modular or non-modular.
   2. Surge Current Rating: Not less than 80 kA per mode/120 kA per phase.
   3. UL 1449 Nominal Discharge Current (I-n): 20 kA.
   4. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
   5. EMI/RFI Filtering: Provide EMI/RFI filter to attenuate electrical noise; listed as complying with UL 1283 for Type 2 SPDs (UL 1283 listing not available for Type 1 SPDs).
      a. Noise Attenuation: Not less than 40 dB at 100 kHz using MIL-STD-220 insertion loss test method.
   6. Diagnostics:
a. Protection Status Monitoring: Provide indicator lights to report the protection status for each phase.
b. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.
c. Remote Status Monitoring: Provide Form C dry type contacts (normally open and normally closed) for remote annunciation of status.
d. Surge Counter: Provide surge event counter with manual reset button, surge count retention upon power loss, and six digit LCD display that indicates quantity of surge events.

B. Model #TG100 or approved equal.
C. Unless otherwise indicated, provide field-installed, externally mounted SPDs.
D. List and label as complying with UL 1449, Type 1 or Type 2.
E. Repetitive Surge Current Capacity: Not less than 5,000 impulses per mode/10,000 impulses per phase.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that the service voltage and configuration marked on the SPD are consistent with the service voltage and configuration at the location to be installed.
B. Verify that electrical equipment is ready to accept connection of the SPD and that installed overcurrent device is consistent with requirements of drawings and manufacturer's instructions.
C. Verify system grounding and bonding is in accordance with Section 260526, including bonding of neutral and ground for service entrance and separately derived systems where applicable. Do not energize SPD until deficiencies have been corrected.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).
B. Install products in accordance with manufacturer's instructions.
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
D. Unless indicated otherwise, connect service entrance surge protective device on load side of service disconnect main overcurrent device.
E. Provide conductors with minimum ampacity as required by NFPA 70, as required by NFPA 70, and as required by NFPA 70.
F. Install conductors between SPD and equipment terminations as short and straight as possible, not exceeding manufacturer's recommended maximum conductor length. Breaker locations may be reasonably rearranged in order to provide leads as short and straight as possible. Twist conductors together to reduce inductance.
G. Install conductors between SPD and equipment within raceway as straight as possible, utilize wide sweeps for conduit bends. Do not utilize sharp conduit bends or "L" shape conduit bodies.
H. Do not energize SPD until bonding of neutral and ground for service entrance and separately derived systems is complete in accordance with Section 260526 where applicable. Replace SPDs damaged by improper or missing neutral-ground bond.
I. Disconnect SPD prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPD connected.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.
B. Inspect and test in accordance with NETA ATS, except Section 4.
C. Perform inspections and tests listed in NETA ATS Section 7.19.1.
D. Procure services of a qualified manufacturer's representative to observe installation and assist in inspection, testing, and adjusting. Include manufacturer's reports with field quality control submittals.

3.04 CLEANING

A. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 264300