



University of Colorado  
Anschutz Medical Campus

Request For Proposal (RFP)  
CU Anschutz AES Radio System Upgrade  
(CU Project #23-109856)



TLH Fire  
6901 S. Pierce St. STE. 205  
Littleton, CO 80128  
TLH Fire Project #21684

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## **SECTION 00 01 04 – PROJECT DIRECTORY**

### **PART 1 - GENERAL**

#### **1.1 PROJECT DIRECTORY**

##### **A. OWNER/UNIVERSITY**

University of Colorado Denver | Anschutz Medical Campus  
Campus Services, Mail Stop F418  
1945 Wheeling Street, Rm 334  
Aurora, CO 80045

Greg Filpus  
GREGORY.FILPUS@CUANSCHUTZ.EDU

##### **B. ARCHITECT/ENGINEER**

TLH FIRE  
6901 S. Pierce St. STE. 205  
Littleton, CO 80128

Jace Horak  
JACE@TLHFIRE.COM

**PART 2 - PRODUCTS (Not Applicable)**

**PART 3 - EXECUTION (Not Applicable)**

**END OF SECTION 00 01 04**



## SECTION 00 01 25

### INTRODUCTION TO GUIDELINES

#### PART 1 - GENERAL

##### 1.1 INTRODUCTION TO DIVISION 00 “PROCUREMENT AND CONTRACTING REQUIREMENTS” AND DIVISION 01 “GENERAL REQUIREMENTS” MASTER SPECIFICATION

- A. Specification Master: The University has prepared a complete Division 01 “General Requirements” master specification required for use on all University projects by Architects, Engineers, and other Design Professionals who provide design services for the University. The master specification has been written to provide a consistent set of general requirements from project to project. They represent the University’s preferred administrative and procedural requirements and are coordinated with State of Colorado Contracts for Construction and General Conditions.
- B. Denver Campus and Anschutz Medical Campus: There are a number of procedures and requirements that differ between the Denver and Anschutz Medical Campuses. As such, the University has developed a unique master for each campus. The Design Professional should take care to obtain the correct campus specific master from the University Project Manager.
- C. Editing Division 00 and Division 01 Master Specifications: It is the intent of these masters to require a minimum amount of editing; however, in all cases some editing will be required to reflect project specific conditions and requirements.
  - 1. Obtaining master specification: The University Project Manager will provide the Design Professional with an editable copy of the Division 01 master in Microsoft Word format.
  - 2. Editor’s notes: Editor’s notes are found throughout the text where the Design Professional is required to make a choice and/or edit the subsequent paragraph(s) in the Section Text based on project specific requirements. Editor’s notes are indicated by Blue, Arial 8pt font surrounded by a thin black line as indicated below. Delete the editor’s notes after making the indicated edits.
  - 3. Options: Optional selections in the Section Text are indicated by a bold font surrounded by brackets. To edit the option, delete all text that is not applicable, remove brackets from around the applicable choice, and change font from bold to normal face. The following is an example of what an editor’s note and optional text look like in the Section Text.
    - a. 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.
  - 4. Format: Do not change format, including but not limited to font typeface and size, page margins, header and footer layout, outline numbering and indents.
    - a. Outline numbering: The document template is set up so that outline numbering is automatic. Use the “Decrease Indent” and “Increase Indent” buttons on the “Paragraph” menu to demote or promote a paragraph in the outline respectively.
    - b. Styles: Automatic numbering, formatting and indents are controlled by the use of Styles within the Microsoft Word document. It is suggested that the editor become familiar with this software capability before editing.
      - 1) Warning: Do not cut and paste text from another document into the master unless familiar with software capability to change Styles. Imported text carries with it

- Styles from the document of origin and will damage the auto-numbering capability of the template unless the appropriate document styles are applied after inserting.
- 2) Hierarchy of styles: The following is the hierarchy of styles within each document:

PRT (PART 1)  
ART (1.1)  
    PR1 (A.)  
        PR2 (1.)  
            PR3 (a.)  
                PR4 ( 1 ) )  
                    PR5 ( a ) )

- 3) Section Title and End of Section: Styles for these are SCT and EOS respectively.

- D. Commissioning: The University may choose to engage a Commissioning Agent (CxA) and provide commissioning on projects. Coordinate project commissioning requirements with University Project Manager and, if required, develop Section 01 91 13 "General Commissioning Requirements" for inclusion in Division 01. Coordinate general commissioning requirements with other required commissioning activities indicated in Mechanical and Electrical Sections, including but not limited to testing and balancing and equipment startup requirements.
- E. Large Project versus Small Project: There are a number of options in the Section Text that distinguish between a large project and a small project. Make the appropriate selection in consultation with University Project Manager. In general, small projects are those with a construction budget of least than \$500,000.

## 1.2 INTRODUCTION TO DIVISION 02 – 33 GUIDELINES

- A. Guidelines: The University has prepared these Guidelines for the benefit and use of Architects, Engineers, and other Design Professionals who provide design services for the University. Divisions 02 through 33 are not intended to be project specifications, nor do they cover all materials and systems which may be required for any given project. These Guidelines represent the University's preferences for the various systems and materials indicated but may not be suitable in all cases. They represent a minimum acceptable level of quality and in some cases indicate preferred and/or required material manufacturers to be used on all projects. Any deviations from this Guideline shall be clearly identified in writing and approved by the University.
- B. University Materials Preferences: In order to be concise and useful to the Design Professional, the Guidelines focus only on materials, systems and/or standards where the University has a preference or where the University standard is higher than that typically accepted within the design and construction industry. In all other cases, it is the Design Professional's responsibility to select and specify appropriate industry standards to govern the fabrication and installation of the work. For example, in SECTION 03 30 00 – CAST-IN-PLACE CONCRETE, the Guidelines do not list ACI 301 – *Specification for Structural Concrete* as a reference standard because it is expected that the Design Professional would include this reference standard as a customary matter of practice without direction to do so by the Guidelines.

## 1.3 Designer-of-Record Responsibility

- A. Notwithstanding the above, the Architect, Engineer, or other Design Professional using this Specification Master and Guideline understands that they alone are the professional designer of record and wholly responsible for the incorporation and/or specification of any and all selections of either systems, components, materials, and/or manufacturers as may be required and appropriate for the design. The

Design Professional is both required and expected to evaluate the suitability of all materials and systems indicated herein for the purpose intended. They alone shall be considered as author of and fully responsible for the entire design. No claim shall be made of or considered by the University or any of its Consultants who assisted the University in authoring these Guidelines related to any design defect alleged to have resulted from the Design Professionals compliance with these Guidelines. By accepting and using these Guidelines the Design Professional acknowledges the above and the limitations indicated therein.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

**END OF SECTION 00 01 25**

## **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 BID/DOCUMENTED QUOTE/RFP/RFQ**  
**State of Colorado**  
*University of Colorado Denver | Anschutz Medical Campus (GFE)*  
**Notice Number: PN 23-109856**

**Notice Status:** OPEN  
**Publish Date:** May 2, 2023  
**# Notice Revisions:** 0  
**Revision Publish Date:** NA

**Project No:** 23-109856  
**Project Title:** CU Anschutz AES Radio System Upgrade  
**Estimated Construction Cost:** \$110,000

**Settlement Notices**

**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 via: Electronic Media**

**Project Description**

Provide and install 7707P-88-M AES radios in each of the University of Colorado Anschutz Medical Campus buildings (quantity 29). Please refer to 284600 Facility Summary to reference buildings and fire alarm control panel type. Provide alarm, waterflow (where necessary), supervisory, trouble, and carbon monoxide reporting zones from the fire alarm control panels for the new AES radios. Each AES radio shall be located at the fire alarm control panel. Confirm exact mounting location with CU prior to installation. Each AES radio shall have a NetCon value of 5. AES Radios and antenna pathways shall be installed in accordance with 284600 CU Technical guidelines and 284600 AES Radio AHJ resource guide. All wire shall be installed in red EMT conduit.

Provide all fire alarm equipment and programming services for each EST panel interface with the new radios. Provide 100% testing of the new AES radios and 10% testing of the existing fire alarm system. 10% testing shall include at least one (1) verification on each reporting zone.

Provide shop drawing submittal for each building to submit to the campus official (refer to sample submittal in division 284600). Shop drawings submittal shall include anticipated antenna types and locations. Submit shop drawings to TLH Fire and CU for review and approval prior to submitting for permit. Verify signal strength as radios are being installed. Rubber ducky antennas are preferred. For private mesh radio networks, provide two (2) AES radios with IP links to CU network. Contractor is all permits and fees.

The contractor shall provide AES Radio equipment for campus dispatch to receive signals. Coordinate with CU for monitoring requirements.

The contractor shall cover all costs associated with penetrations (interior and exterior). Roof penetrations shall be performed by a licensed roofing contractor.

The contractor shall provide an installation and testing schedule to CU with bid for review and approval (refer to 284600 Example Schedule).

### **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. To be considered as qualified, interested firms shall have, as a minimum:

1. Provided General Contracting services within the last three (3) years for at least two (2) projects each in excess of \$110,000 (hard costs), utilizing the expertise present in their Colorado Office; and
2. Demonstrated specific General Contracting experience in projects of similar scope and complexity; and
3. Demonstrated bonding capability up to \$110,000 for an individual project coincidentally with current and anticipated workloads; provide letter from surety that affirms this capacity.

### **Other Information**

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

### **Pre-Bid Meeting**

A mandatory Pre-Bid Meeting will be held:

**University of Colorado Anschutz Medical Campus  
At Fitzsimons front lobby, Aurora, Colorado 80045**

Comments: **Pre-Bid meeting will begin at 9:00 AM on May 17, 2023**

### **Schedule/Submission Details**

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

Advertisement	<u>5/2/2023</u>
Mandatory Pre-Bid Conference and Tour	<u>5/17/2023 - 9:00AM</u>
Date Email Questions Due	<u>5/24/2023 - 2:00PM</u>
Date Email Answers Issued	<u>5/31/2023</u>
Sealed Bids Due	<u>6/7/2023 - 2:00PM</u>
Contract Approval (projected)	<u>6/28/2023</u>
Anticipated Design Start	<u>7/12/2023</u>
Construction Start	<u>9/2023</u>
Construction Finish	<u>Contractor to provide.</u>

2. **ONE (1)** electronic copy submittal bid is due on 6/7/2022 and shall be received no later than 2:00 PM, and shall be submitted accepted via email. Send to [https://ucdenverdata.formstack.com/forms/rfp\\_rfq\\_submission](https://ucdenverdata.formstack.com/forms/rfp_rfq_submission) and copy [jace@tlhfire.com](mailto:jace@tlhfire.com).
3. The above schedule is tentative. Responding firms shall be notified of revisions in a timely manner by email. Respondents may elect to verify times and dates by email, but no earlier than 36 hours before the schedule date and time.

### **Point of Contact/Clarification**

Name: **Gregory Filpus**

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Agency: **University of Colorado Denver | Anschutz Medical Campus (GFE)**

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Phone: **720.281.7417**

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Email: **GREGORY.FILPUS.@CUANSCHUTZ.EDU**

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## **SECTION 00 21 13 – INFORMATION TO BIDDERS**

### **PART 1 - GENERAL**

- 1.1 RELATED DOCUMENTS (Not Applicable)
- 1.2 SUMMARY (Not Applicable)
- 1.3 DEFINITIONS (Not Applicable)
- 1.4 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.
- 1.5 PROCEDURE (Not Applicable)

### **PART 2 - PRODUCTS (Not Applicable)**

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

**END OF SECTION 00 21 13**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAMS

**INFORMATION FOR BIDDERS**

Institution or Agency: \_\_\_\_\_  
Project No./Name: \_\_\_\_\_

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. Bids shall be submitted in sealed envelopes bearing the address and information shown below. If a bid is submitted by mail, this aforementioned sealed envelope should be enclosed in an outer envelope and sent to the following addressee:

**INSERT NAME OF AGENCY AND ADDRESS WHERE BID SHOULD BE DELIVERED**

The outside of the sealed inner envelope should bear the following information:

Project # 23-109856  
CU Anschutz AES Radio System Upgrade  
Name and Address of Bidder  
Date of Opening  
Time of Opening

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.
4. **UNAUTHORIZED IMMIGRANTS:** Note that the Special Provisions of the General Conditions of the Contract includes the following language: PUBLIC CONTRACTS FOR SERVICES - CRS 8-17.5-101 and PUBLIC CONTRACTS WITH NATURAL PERSONS - 24-76.5-101. The Contractor certifies that the Contractor shall comply with the provisions of CRS 8-17.5-101 et seq. The Contractor shall not knowingly employ or contract with an illegal alien to perform work under this contract or enter into a contract with a subcontractor that fails to certify to the Contractor that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this contract. The Contractor represents, warrants, and agrees that it (i) has verified that it does not employ any illegal aliens, through participation in the Basic Pilot Employment Verification Program administered by the Social Security Administration and Department of Homeland Security, and (ii) otherwise will comply with the requirements of CRS 8-17.5-102(2)(b). The Contractor shall comply with all reasonable requests made in the course of an investigation under CRS 8-17.5-102 by the Colorado Department of Labor and Employment. If the Contractor fails to comply with any requirement of this provision or CRS 8-17.5-101 et seq., the State may terminate this contract for breach and the Contractor shall be liable for actual and consequential damages to the State.



A Contractor that operates as a sole proprietor hereby swears or affirms under penalty of perjury that the Contractor (i) is a citizen of the United States or otherwise lawfully present in the United States pursuant to federal law, (ii) shall comply with the provisions of CRS 24-76.5-101 et seq, and (iii) shall produce one of the forms of identification required by CRS 24-76.5-103 prior to the effective date of this Contract. Except where exempted by federal law and except as provided in CRS 24-76.5-103(3), a Contractor that receives federal or state funds under this contract must confirm that any individual natural person eighteen years of age or older is lawfully present in the United States pursuant to CRS 24-76.5-103(4) if such individual applies for public benefits provided under this contract.

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.
8. **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.
9. **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.

The Advertisement for Bids can be located at the web site: [www.colorado.gov/pacific/osa/cdnotices](http://www.colorado.gov/pacific/osa/cdnotices)  
(Click on the appropriate link [ColoradoVSS or ColoradoBIDS] or on the State Purchasing Office website)

## **SECTION 00 41 53 – BID FORM**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY – BASE BID**

- A. Provide and install 7707P-88-M AES radios in each of the University of Colorado Anschutz Medical Campus buildings (quantity 29). Please refer to 284600 Facility Summary to reference buildings and fire alarm control panel type. Provide alarm, waterflow (where necessary), supervisory, trouble, and carbon monoxide reporting zones from the fire alarm control panels for the new AES radios. Each AES radio shall be located at the fire alarm control panel. Confirm exact mounting location with CU prior to installation. Each AES radio shall have a NetCon value of 5. AES Radios and antenna pathways shall be installed in accordance with 284600 CU Technical guidelines and 284600 AES Radio AHJ resource guide. All wire shall be installed in red EMT conduit.
- B. Provide all fire alarm equipment and programming services for each EST panel interface with the new radios. Provide 100% testing of the new AES radios and 10% testing of the existing fire alarm system. 10% testing shall include at least one (1) verification on each reporting zone.
- C. Provide shop drawing submittal for each building to submit to the campus official (refer to sample submittal in division 284600). Shop drawings submittal shall include anticipated antenna types and locations. Submit shop drawings to TLH Fire and CU for review and approval prior to submitting for permit. Verify signal strength as radios are being installed. Rubber ducky antennas are preferred. For private mesh radio networks, provide two (2) AES radios with IP links to CU network. Contractor is all permits and fees.
- D. The contractor shall provide AES Radio equipment for campus dispatch to receive signals. Coordinate with CU for monitoring requirements.
- E. The contractor shall cover all costs associated with penetrations (interior and exterior). Roof penetrations shall be performed by a licensed roofing contractor.
- F. The contractor shall provide an installation and testing schedule to CU with bid for review and approval (refer to 284600 Example Schedule).

#### **1.3 DEFINITIONS (Not Applicable)**

#### **1.4 BID FORM**

- A. FORM: State of Colorado form “Bid” (SBP-6.13).
- 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.

#### **1.5 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**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAMS

**BID**

Institution/Agency: \_\_\_\_\_

Project No./Name: \_\_\_\_\_

Bidder Acknowledges Receipt of Addenda Numbers: \_\_\_\_\_

Bidder Anticipates Services outside the United States or Colorado:\*

No ☐ Yes ☐ If Yes see 3A 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:\*

No ☐ 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. **PARTIES 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% Colorado 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 \_\_\_\_\_, 23\_\_\_\_\_

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 43 13 – BID BOND**

### **PART 1 - GENERAL**

- 1.1 RELATED DOCUMENTS (Not Applicable)
- 1.2 SUMMARY (Not Applicable)
- 1.3 DEFINITIONS (Not Applicable)
- 1.4 BID BOND
  - A. FORM: State of Colorado form “Bid Bond” (SBP-6.14).
  - B. A copy of the above noted form is attached to the end of this section.
- 1.2 PROCEDURES
  - A. This bid bond must be accompanied by Power of Attorney.

### **PART 2 - PRODUCTS (Not Applicable)**

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

**END OF SECTION 00 43 13**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

**BID BOND**

Institution/Agency: \_\_\_\_\_

Project No./Name: \_\_\_\_\_

**KNOW ALL MEN BY THESE PRESENTS:**

**WHEREAS**, \_\_\_\_\_ 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, Certificates of Insurance and Certification and Affidavit Regarding Illegal Aliens, 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., 23\_\_\_\_\_.

(Corporate Seal)

ATTEST

Secretary

Name (Print)

**THE PRINCIPAL**

Company Name

Address (including city, state and zip)

Phone number: \_\_\_\_\_

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)

Secretary

**THE SURETY**

By \_\_\_\_\_

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.**

## **SECTION 00 43 23 – BID ALTERNATES FORM**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

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

#### **1.2 SUMMARY**

- A. Provide building fire alarm yearly testing. Refer to 284600 Fire alarm Testing and provide price per building as indicated on the worksheet. Provide total price for each year (alternates 1-5).

#### **1.3 DEFINITIONS (Not Applicable)**

#### **1.4 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.

#### **1.5 PROCEDURES**

- 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**





STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

**BID ALTERNATES FORM**

Institution/Agency: \_\_\_\_\_

Project No./Name: \_\_\_\_\_

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 \_\_\_\_\_ for descriptions of add alternates. If the add alternates are accepted, the base bid would be modified by the amount entered by the bidder.

A.A. No. 1	100% Fire Alarm Testing 2023 (Submit Table)	Add \$	_____
A.A. No. 2	100% Fire Alarm Testing 2024 (Submit Table)	Add \$	_____
A.A. No. 3	100% Fire Alarm Testing 2025 (Submit Table)	Add \$	_____
A.A. No. 4	100% Fire Alarm Testing 2026 (Submit Table)	Add \$	_____
A.A. No. 5	100% Fire Alarm Testing 2027 (Submit Table)	Add \$	_____

**Deductive Alternates** (If Applicable)

Refer to specification section \_\_\_\_\_ for descriptions of the 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 \_\_\_\_\_ Deduct \$ \_\_\_\_\_

THE BIDDER:

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## **SECTION 00 43 40**

### **CERTIFICATE AND AFFIDAVIT REGARDING UNAUTHORIZED IMMIGRANTS**

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

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY

- A. The form UI-1 shall be provided by all contractors, architect, engineers and consultants directly engaged with the University of Colorado Denver | Anschutz Medical Campus.

1.3 DEFINITIONS (Not Applicable)

1.4 CERTIFICATE AND AFFIDAVIT REGARDING UNAUTHROIZED IMMIGRANTS

- A. FORM: State of Colorado form “CERTIFICATE AND AFFIDAVIT REGARDING UNAUTHORIZED IMMIGRANTS” (UI-1).
- 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 43 40**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAMS

**CERTIFICATION AND AFFIDAVIT REGARDING UNAUTHORIZED IMMIGRANTS**

Institution/Agency: University of Colorado Denver | Anschutz Medical Campus

Project No./Name: CU Anschutz AES Radio System Upgrade / 23-109856

**A. CERTIFICATION STATEMENT CRS 8-17.5-101 & 102 (HB 06-1343, SB 08-193)**

The Vendor, whose name and signature appear below, certifies and agrees as follows:

1. The Vendor shall comply with the provisions of CRS 8-17.5-101 et seq. The Vendor shall not knowingly employ or contract with an unauthorized immigrant to perform work for the State or enter into a contract with a subcontractor that knowingly employs or contracts with an unauthorized immigrant.
2. The Vendor certifies that it does not now knowing employ or contract with an unauthorized immigrant who will perform work under this contract, and that it will participate in either (i) the "E-Verify Program", jointly administered by the United States Department of Homeland Security and the Social Security Administration, or (ii) the "Department Program" administered by the Colorado Department of Labor and Employment in order to confirm the employment eligibility of all employees who are newly hired to perform work under this contract.
3. The Vendor shall comply with all reasonable requests made in the course of an investigation under CRS 8-17.5-102 by the Colorado Department of Labor and Employment. If the Vendor fails to comply with any requirement of this provision or CRS 8-17.5-101 et seq., the State may terminate work for breach and the Vendor shall be liable for damages to the State.

**B. AFFIDAVIT CRS 24-76.5-101 (HB 06S-1023)**

1. If the Vendor is a **sole proprietor**, the undersigned hereby swears or affirms under penalty of perjury under the laws of the State of Colorado that (check one):

☐ I am a United States citizen, or

☐ I am a Permanent Resident of the United States, or

☐ I am lawfully present in the United States pursuant to Federal law.

I understand that this sworn statement is required by law because I am a sole proprietor entering into a contract to perform work for the State of Colorado. I understand that state law requires me to provide proof that I am lawfully present in the United States prior to starting work for the State. I further acknowledge that I will comply with the requirements of CRS 24-76.5-101 et seq. and will produce the required form of identification prior to starting work. I acknowledge that making a false, fictitious, or fraudulent statement or representation in this sworn affidavit is punishable under the criminal laws of Colorado as perjury in the second degree under CRS 18-8-503 and it shall constitute a separate criminal offense each time a public benefit is fraudulently received.

CERTIFIED and AGREED to this day \_\_\_\_\_.

VENDOR:

\_\_\_\_\_  
Vendor Full Legal Name

BY: \_\_\_\_\_  
Signature of Authorized Representative

\_\_\_\_\_  
Title

**SECTION 00 51 00 – NOTICE OF AWARD (D/B/B)**

**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY (Not Applicable)

1.3 DEFINITIONS (Not Applicable)

1.4 NOTICE OF AWARD

A. FORM: State of Colorado form “Notice of Award” (SBP-6.15) for Design/Bid/Build Agreements.

B. Copies 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 51 00**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAMS

**NOTICE OF AWARD**

(Design/Bid/Build and Design/Build Lump Sum Agreements)

Date of Notice: \_\_\_\_\_

\_\_\_\_\_ Date to be inserted by the Agency/Institution

Agency/Institution: University of Colorado Denver | Anschutz Medical Campus

Project No./Name: CU Anschutz AES Radio System Upgrade / 23-109856

TO:

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 \_\_\_\_\_ DOLLARS AND NO/100\* (\$\_\_\_\_\*) 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, Certification and Affidavit Regarding Unauthorized Immigrants 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, Certification and Affidavit Regarding Unauthorized Immigrants, 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 Programs                      Date  
(or Authorized Delegate)

By \_\_\_\_\_  
Principal Representative                      Date  
(Agency/Institution)

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 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 DESIGN/BID/BUILD (D/B/B) AGREEMENT  
(STATE FORM SC-6.21)**

---

DEPARTMENT ID:

CONTRACT ID #:

PROJECT #:

PROJECT NAME:

VENDOR NAME:

---

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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**EXHIBITS:**

- A. Contractor's Bid (Form SC-6.13)
- B. Performance Bond (Form SC-6.22)
- C. Labor and Material Payment Bond (Form SC-6.221)
- D. Insurance Certificates
- E. Certification and Affidavit Regarding Unauthorized Immigrants (State Form UI - 1), (required at contract signing prior to commencing work)
- F. Building Code Compliance Policy: Coordination of Approved Building Codes, Plan Reviews and Building Inspections.



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: \_\_\_\_\_ Contract ID #: \_\_\_\_\_ Project #: \_\_\_\_\_

**1. PARTIES.** THIS AGREEMENT is entered into by and between the STATE OF COLORADO, acting by and through the (agency), hereinafter referred to as the Principal Representative, and (vendor name) having its offices at (vendor address) 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 liable to pay or reimburse Contractor for any performance hereunder or be bound by any provision hereof prior to the Effective Date.

**RECITALS:**

**WHEREAS**, the Principal Representative intends to procure (project name) 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 In Fund Number \_\_\_\_\_, Account Number \_\_\_\_\_; and

WHEREAS, this is a phase one waived contract, waiver number 156 Contractors Agreement for Capital Construction Form SC6.21.

**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 Architect/Engineer in strict accordance with the provisions of the Contract Documents.

**ARTICLE 3. TIME OF COMPLETION**

The Contractor agrees to Substantially Complete the Project within \_\_\_\_\_ 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 \_\_\_\_\_ calendar days for a total time of completion of the entire Project of \_\_\_\_\_ 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 7.4 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 \_\_\_\_\_ DOLLARS AND NO/100\* (\$\_\_\_\_\_ \*).

## **ARTICLE 6. CONTRACT DOCUMENTS**

The Contract Documents, as enumerated in Article 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.

### **1. 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

### **2. MODIFICATION 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

### **3. 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

### **4. 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 only to the extent noted.

4.1. 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 to

(\$ \_\_\_\_\_) 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.

4.2. 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 \_\_\_\_\_ (\$ ) 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:

With copies to (State Buildings Program (or Delegate) State of Colorado):

Notice to Contractor:

With copies to:

**SIGNATURE APPROVALS:**

**THE PARTIES HERETO HAVE EXECUTED THIS CONTRACT**

\*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**

**THE CONTRACTOR**

**STATE OF COLORADO**, acting by and through:  
*(Insert Name of Agency or IHE)*

\_\_\_\_\_  
Legal Name of Contracting Entity

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

*(Insert Name & Title of Principal  
Representative for Agency or IHE)*

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

\_\_\_\_\_  
\*Signature

**APPROVED**

DEPARTMENT OF PERSONNEL &  
ADMINISTRATION  
STATE BUILDINGS PROGRAM  
State Architect (or authorized Delegate)

By \_\_\_\_\_

Name (print) Title

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

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

*(Insert Name of Authorized Individual)*

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

**ALL CONTRACTS MUST BE APPROVED BY THE STATE CONTROLLER:**

C.R.S. § 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 Contractor 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: \_\_\_\_\_

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

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

**EXHIBIT A**

---

**CONTRACTOR'S BID (Form SBP-6.13)**

**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 (Form SC-6.22)**

**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 (Form SC-6.221)**

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

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

**EXHIBIT D**

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**INSURANCE CERTIFICATE(S)** (attached)



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

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

**EXHIBIT E**

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**Certification and Affidavit Regarding Unauthorized Immigrants** (State Form UI-1), (required at contract signing prior to commencing work)

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

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

**EXHIBIT F**

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**Building Code Compliance Policy: Coordination of Approved Building Codes, Plan Reviews and Building Inspections**

## **SECTION 00 55 00 – NOTICE TO PROCEED**

### **PART 1 - GENERAL**

- 1.1 RELATED DOCUMENTS (Not Applicable)
- 1.2 SUMMARY (Not Applicable)
- 1.3 DEFINITIONS (Not Applicable)
- 1.4 NOTICE TO PROCEED
  - A. FORM: State of Colorado form “Notice To Proceed (Design/Bid/Build Contract)” (SBP-6.26).
  - 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 55 00**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

**NOTICE TO PROCEED (DESIGN/BID/BUILD CONTRACT)**

Date of Notice: \_\_\_\_\_  
Date to be inserted by the Principal Representative  
Date/Description of Contract Documents: \_\_\_\_\_  
Institution/Agency: University of Colorado Denver | Anschutz Medical Campus  
Project No./Name: CU Anschutz AES Radio System Upgrade / 23-109856

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 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 completion date of the Project is \_\_\_\_\_ (M/D/YYYY).

By \_\_\_\_\_  
State Buildings Program  
(or Authorized Delegate) Date

By \_\_\_\_\_  
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 61 13.13 – PERFORMANCE BOND**

### **PART 1 - GENERAL**

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY (Not Applicable)

1.3 DEFINITIONS (Not Applicable)

1.4 PERFORMANCE BOND

A. FORM: State of Colorado form “Performance Bond” (SC-6.22).

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

1.2 PROCEDURE

A. Performance Bond is required for construction values of \$150,000 or more.

B. This bond must be accompanied by Power of Attorney.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

**END OF SECTION 00 61 13.13**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

**PERFORMANCE BOND**

Institution/Agency: University of Colorado Denver | Anschutz Medical Campus

Project No./Name: CU Anschutz AES Radio System Upgrade / 23-109856

**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 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 Representative", in the sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_)

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 \_\_\_\_\_, 20\_\_\_\_, for the construction of a PROJECT described as \_\_\_\_\_

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 hereinbefore 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, this \_\_\_\_\_ day of , A.D., \_\_\_\_\_ 20\_\_\_\_\_

(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.

## **SECTION 00 61 13.16 – LABOR AND MATERIAL BOND**

### **PART 1 - GENERAL**

- 1.1 RELATED DOCUMENTS (Not Applicable)
- 1.2 SUMMARY (Not Applicable)
- 1.3 DEFINITIONS (Not Applicable)
- 1.4 LABOR AND MATERIAL BOND
  - A. FORM: State of Colorado form “Labor and Material Bond” (SC-6.221).
  - B. A copy of the above noted form is attached to the end of this section.
- 1.5 PROCEDURES
  - A. Labor and Material Bond is required for construction values of \$150,000 or more.
  - B. This bond must be accompanied by Power of Attorney.

### **PART 2 - PRODUCTS (Not Applicable)**

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

**END OF SECTION 00 61 13.16**





STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

**LABOR AND MATERIAL BOND**

Institution/Agency: University of Colorado Denver | Anschutz Medical Campus

Project No./Name: CU Anschutz AES Radio System Upgrade / 23-109856

**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 Board of Regents of the University of Colorado, a body corporate, for and on behalf of the University of Colorado Denver, 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 \_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

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 \_\_\_\_\_, 20\_\_\_\_ for the construction of a PROJECT described as

which Contract is hereby by reference made a part hereof;

**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 if 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 forbearance 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 forbearance being hereby waived.

**IN WITNESS WHEREOF**, the Principal and the Surety have executed this Bond, this \_\_\_\_\_ day of \_\_\_\_\_, A.D., 20\_\_\_\_\_.

(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 performance of the contract.

## **SECTION 00 62 16 – CERTIFICATE OF INSURANCE**

### **PART 1 - GENERAL**

- 1.1 RELATED DOCUMENTS (Not Applicable)
- 1.2 SUMMARY (Not Applicable)
- 1.3 DEFINITIONS (Not Applicable)
- 1.4 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.
- 1.5 PROCEDURE (Not Applicable)

### **PART 2 - PRODUCTS (Not Applicable)**

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

**END OF SECTION 00 62 16**



# CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)  
CURRENT DATE

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 COMPANY ADDRESS CITY, STATE, ZIP CODE	CONTACT NAME: PHONE (A/C, No, Ext): E-MAIL ADDRESS: FAX (A/C, No):														
INSURED  INSURED NAME INSURED ADDRESS INSURED CITY, STATE, ZIP CODE	<table border="1"><thead><tr><th>INSURER(S) AFFORDING COVERAGE</th><th>NAIC #</th></tr></thead><tbody><tr><td>INSURER A :</td><td></td></tr><tr><td>INSURER B :</td><td></td></tr><tr><td>INSURER C :</td><td></td></tr><tr><td>INSURER D :</td><td></td></tr><tr><td>INSURER E :</td><td></td></tr><tr><td>INSURER F :</td><td></td></tr></tbody></table>	INSURER(S) AFFORDING COVERAGE	NAIC #	INSURER A :		INSURER B :		INSURER C :		INSURER D :		INSURER E :		INSURER F :	
INSURER(S) AFFORDING COVERAGE	NAIC #														
INSURER A :															
INSURER B :															
INSURER C :															
INSURER D :															
INSURER E :															
INSURER F :															

## 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.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY <input type="checkbox"/> CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> POLLUTION LIABILITY GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC OTHER:	Y		POLICY NUMBER	01/01/2019	01/01/2020	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000
	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY ANY AUTO <input checked="" type="checkbox"/> OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input checked="" type="checkbox"/> HIRED AUTOS ONLY <input checked="" type="checkbox"/> NON-OWNED AUTOS ONLY	Y	Y	POLICY NUMBER	01/01/2019	01/01/2020	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$
	<input checked="" type="checkbox"/> WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N <input checked="" type="checkbox"/> Y	N/A	Y	POLICY NUMBER	01/01/2019	01/01/2020
E	PROFESSIONAL LIABILITY		Y	POLICY NUMBER	01/01/2019	01/01/2020	Each Occurrence 2,000,000 Aggregate 2,000,000

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

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

DATE (MM/DD/YYYY)  
CURRENT TEXT

THIS EVIDENCE OF PROPERTY INSURANCE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS 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):	COMPANY  INSURANCE COMPANY
FAX (A/C, 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
	<input type="checkbox"/> 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

COVERAGE / PERILS / FORMS	AMOUNT OF INSURANCE	DEDUCTIBLE
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	<input checked="" type="checkbox"/> ADDITIONAL INSURED	LENDER'S LOSS PAYABLE	<input type="checkbox"/> LOSS PAYEE
	MORTGAGEE	<input checked="" type="checkbox"/> Waiver of Subrogation	
	LOAN #		
	AUTHORIZED REPRESENTATIVE AUTHORIZED REPRESENTATIVE SIGNATURE		

## **SECTION 00 62 76 – APPLICATION AND CERTIFICATE FOR CONTRACTORS PAYMENT FORM**

### **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 the contractual requirements of this Project.
- B. Related Requirements:
  - 1. 01 29 00 – Payment Procedures

#### **1.3 DEFINITIONS (Not Applicable)**

#### **1.4 FORMS**

- A. APPLICATION AND CERTIFICATE FOR CONTRACTORS PAYMENT (SBP-7.2)
  - 1. Download Link: <https://drive.google.com/open?id=0ByG39KP3LPICVHVqenlySGJIMFE>

#### **1.5 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**

#### **1.1 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 “Change Order Bulletin” (SC-6.311).
- 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 46**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

**CHANGE ORDER BULLETIN**

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Change Order Bulletin No: \_\_\_\_\_ Date \_\_\_\_\_

Contractor: \_\_\_\_\_

Institution or Agency: \_\_\_\_\_

Project No./Name: \_\_\_\_\_

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**

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY (Not Applicable)

1.3 DEFINITIONS (Not Applicable)

1.4 CHANGE ORDER PROPOSAL

A. State of Colorado form “Change Order Proposal” (SC-6.312).

1. Download link: [https://drive.google.com/file/d/1Uo7i4h3LqpByA8GUYEI5K9qne\\_8hSwtS/view](https://drive.google.com/file/d/1Uo7i4h3LqpByA8GUYEI5K9qne_8hSwtS/view)

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 53**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAMS

CHANGE ORDER PROPOSAL

(enter information ONLY in YELLOWED cells)

Change Order Proposal No. \_\_\_\_\_ Date \_\_\_\_\_

Change Order Bulletin No: \_\_\_\_\_

Description of Work: (enter into text box)

Date \_\_\_\_\_

Contractor \_\_\_\_\_

Institution or Agency \_\_\_\_\_

Project No./Name \_\_\_\_\_

(Before completing this form, read instructions on reverse side.)

**PART I - WORK PERFORMED BY CONTRACTOR**

Line 1.	Direct Labor Costs		\$		
Line 2.	Labor Overhead (Direct Labor Burdens)	( _____ x Line 1)	\$	0.00	
Line 3.	Total Contractor's Labor Costs (Lines 1 and 2)		\$	0.00	
Line 4.	Direct Materials Costs		\$		
Line 5.	Materials Overhead (Delivery Costs & Taxes)	( _____ x Line 4)	\$	0.00	
Line 6.	Total Materials Costs (Lines 4 and 5)		\$	0.00	
Line 7.	Total Equipment Costs		\$		
Line 8.	PART I - TOTAL CONTRACTOR'S L, M & E COSTS (Lines 3, 6 and 7)		Part I	\$	0.00

**PART II - WORK PERFORMED BY SUBCONTRACTOR**

Line 9.	Direct Labor Costs		\$		
Line 10.	Labor Overhead (Direct Labor Burdens)	( _____ x Line 9)	\$	0.00	
Line 11.	Total Subcontractor's Labor Costs (Lines 9 and 10)		\$	0.00	
Line 12.	Direct Materials Costs		\$		
Line 13.	Materials Overhead (Delivery Costs & Taxes)	( _____ x Line 12)	\$	0.00	
Line 14.	Total Subcontractor's Materials Costs (Lines 12 and 13)		\$	0.00	
Line 15.	Total Subcontractor's Equipment Costs		\$		
Line 16.	Total Subcontractor's L, M & E Costs (Line 11, 14 and 15)		\$	0.00	
Line 17.	Subcontractor's Overhead (Indirect Costs)	( 10.0% x Line 16)	\$	0.00	
Line 18.	Subcontractor's Profit (on line 16) _____ Addition or Deduct _____		\$	0.00	
Line 19.	PART II - TOTAL SUBCONTRACTOR'S COSTS (Lines 16, 17 and 18)		Part II	\$	0.00

**PART III - CONTRACTOR'S OVERHEAD & PROFIT**

Line 20.	Contractor's Overhead (Indirect Costs)	( 10.0% x Part I Total)	\$	0.00	
Line 21.	Contractor's Profit	( 5.0% x Part I Total)	\$	0.00	
Line 22.	PART III - TOTAL CONTRACTOR OVERHEAD & PROFIT (Lines 20 and 21)		Part III	\$	0.00

**PART IV - CONTRACTOR'S MARKUP ON SUBCONTRACTOR**

Line 23.	Contractor's Commission on Subcontractor	( 5.0% x Part II Total)	\$	0.00	
Line 24.	Contractor's Profit (on Line 19) _____ Addition or Deduct _____		\$	0.00	
Line 25.	PART IV - TOTAL CONTRACTOR MARKUP ON SUBCONTRACTOR (Lines 23 and 24)		Part IV	\$	0.00

**PART V - SUBTOTAL C.O. PROPOSAL (Parts I and II and III and IV)**

			Part V (Subtotal)	\$	0.00
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**PART VI - CONTRACTOR'S BOND COST**

	( _____ x Part V Total)		Part VI	\$	0.00
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**PART VII - GRAND TOTAL CHANGE ORDER PROPOSAL (Sum of Totals: Parts V and VI)**

			Grand Total	\$	0.00
--	--	--	-------------	----	------

**PART VIII - CONTRACT TIME (CALENDAR DAYS CHANGED)** ☐ EXTENDED ☐ NO CHANGE ☐ REDUCED ☐ Days

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: \_\_\_\_\_

\* The proposal shall remain in full force and effect for a period of \_\_\_\_\_ calendar days from date of signature.

**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: \_\_\_\_\_

STATE BUILDINGS PROGRAMS (or Authorized Delegate)

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



**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:

Trade	Rate	Duration	Extended Costs
	\$ _____ x _____		= \$ _____ 0
	\$ _____ x _____		= \$ _____ 0
Direct Labor Cost			= \$ _____ 0

Line 2. Labor Overhead (Direct Labor Burdens, etc.): Enter percentage (as submitted in Schedule of Values) of Line 1 as applicable. (Spread

Line 3. Total 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:

Materials	Rate	Quantity	Extended Costs
	\$ _____ x _____		= \$ _____ 0
	\$ _____ x _____		= \$ _____ 0
Direct Materials Cost			= \$ _____ 0

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:

Equipment	Rate	Duration	Extended Costs
	\$ _____ x _____		= \$ _____ 0
	\$ _____ x _____		= \$ _____ 0
Total Equipment Cost			= \$ _____ 0

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 9. Direct Labor Costs: See Line 1 instructions.

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 12. Direct Material Cost: See Line 4 instructions.

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 15. Total Subcontractor's Equipment Costs: See Line 7 instructions.

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 "1" in appropriate cell. For an addition, Edit E37, a deduct, 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 23, Edit percentages applicable to Line 18. See Article 35 of General Conditions.

Part 4. Line 24, Enter a "1" in appropriate cell. For an addition, edit E45, a deduct 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 prevalent, 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.

## **SECTION 00 63 63 – CHANGE ORDER**

### **PART 1 - GENERAL**

- 1.1 RELATED DOCUMENTS (Not Applicable)
- 1.2 SUMMARY (Not Applicable)
- 1.3 DEFINITIONS (Not Applicable)
- 1.4 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.
- 1.5 PROCEDURE (Not Applicable)

### **PART 2 - PRODUCTS (Not Applicable)**

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

**END OF SECTION 00 63 63**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

**CHANGE ORDER**

Change Order No: \_\_\_\_\_ Contract ID No. \_\_\_\_\_ Date \_\_\_\_\_

Contractor: \_\_\_\_\_

Institution or Agency: \_\_\_\_\_

Project No./Name: \_\_\_\_\_

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 hereto.)

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).

SUMMARY OF CHANGES			
	Description of Work/Date	Time of Completion/ Calendar Days Extended/Reduced	Dollar Amounts
Original Contract			
Change Order #1			
Change Order #2			
Current Totals			

\*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.**

Architect/Engineer Firm	Name and Title (print)	Date	
	Signature		
Contractor (Name of Firm)	Name and Title (print)	Date	
	Signature		
Institution or Agency	Name and Title (print)	Principal Representative (Signature)	Date

CONTRACT STATUS			
Original Contract Value		STATE BUILDINGS PROGRAM (or Authorized Delegate)	DATE
Previous increases by CO/Amend			
Previous decreases by CO/Amend			
Value After Prior CO's/Amend		STATE CONTROLLER (or Authorized Delegate)	DATE
This CO/Amend			
Increases <input type="checkbox"/> Decreases <input type="checkbox"/>			
CURRENT CONTRACT VALUE		(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: \_\_\_\_\_

Project No./Name: \_\_\_\_\_

---

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.



SUMMARY OF CHANGES			
	Description of Work/Date	Time of Completion/ Calendar Days Extended/Reduced	Dollar Amounts
Original Contract			
Amendment #1			
Current Total Amount of Contract (To Date):			

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 Contractor 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 16 – NOTICE OF SUBSTANTIAL COMPLETION**

### **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 “Notice of Substantial Completion” (SPB-07).
- 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 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: \_\_\_\_\_

Project No./Name: \_\_\_\_\_

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

_____ 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 19.01 – BUILDING INSPECTION RECORD**

### **PART 1 - GENERAL**

1.1 RELATED DOCUMENTS (Not Applicable)

1.2 SUMMARY (Not Applicable)

1.3 DEFINITIONS (Not Applicable)

1.4 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.

1.5 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**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

BUILDING INSPECTION RECORD

Institution or Agency: \_\_\_\_\_

Project No./Name: \_\_\_\_\_

Building Official/Code Review Agent: \_\_\_\_\_ Type of Construction: \_\_\_\_\_

Architect/Engineer: \_\_\_\_\_ Occupancy Classifications: \_\_\_\_\_

Contractors: \_\_\_\_\_ Project Manager: \_\_\_\_\_

General: \_\_\_\_\_ Project Manager Signature \_\_\_\_\_

Electrical: \_\_\_\_\_ At Completion: \_\_\_\_\_

Mechanical: \_\_\_\_\_ Inspector of Record Signature \_\_\_\_\_

Plumbing: \_\_\_\_\_ at Completion: \_\_\_\_\_

Notice to Proceed Date: \_\_\_\_\_ BIR Completion Date: \_\_\_\_\_

Provide If  
Checked

\* No work shall be concealed or covered until the appropriate inspector has inspected and approved.

	Building (Consultant)	Date	Inspector/ICC#	Comments or Corrections
<input type="checkbox"/>	Footings/Foundations			
<input type="checkbox"/>	Concrete Slab / Under-Floor			
<input type="checkbox"/>	Framing (after rough elec/mech/plumb)			
<input type="checkbox"/>	Lath and Gypsum Board			
<input type="checkbox"/>	Fire-Resistant Penetrations			
<input type="checkbox"/>	Mechanical/Energy Efficiency			
<input type="checkbox"/>	Roofing			
<input type="checkbox"/>	Other			
<input type="checkbox"/>	Final			

	Special (Consultant)	Date	Inspector	Comments or Corrections
<input type="checkbox"/>	Steel			
<input type="checkbox"/>	Concrete			
<input type="checkbox"/>	Masonry			
<input type="checkbox"/>	Wood			
<input type="checkbox"/>	Soils/Foundations			
<input type="checkbox"/>	Spray-Applied Fireproofing			
<input type="checkbox"/>	Smoke Control Systems			
<input type="checkbox"/>	Other			

	Elevator Inspection (State)	Date	Inspector	Comments or Corrections
<input type="checkbox"/>	Final			

	Electrical (Co. St. Electrical Bd.)	Date	Inspector	Comments or Corrections
<input type="checkbox"/>	Underground			
<input type="checkbox"/>	Rough Walls			
<input type="checkbox"/>	Rough Ceilings			
<input type="checkbox"/>	Final			

**Place this card in an obvious, protected location, along with all related inspection reports and documents.**

SBP-BIR  
Rev. 5/2012



This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

## **SECTION 00 65 19.23 – PRE-ACCEPTANCE CHECKLIST**

### **PART 1 - GENERAL**

- 1.1 RELATED DOCUMENTS (Not Applicable)
- 1.2 SUMMARY (Not Applicable)
- 1.3 DEFINITIONS (Not Applicable)
- 1.4 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.
- 1.5 PROCEDURE (Not Applicable)

### **PART 2 - PRODUCTS (Not Applicable)**

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

**END OF SECTION 00 65 19.23**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAMS

**PRE-ACCEPTANCE CHECKLIST\***

Institution or Agency: \_\_\_\_\_ Final Punch List Date \_\_\_\_\_  
Architect/Engineer: \_\_\_\_\_  
Contractor: \_\_\_\_\_  
Project No./Name: \_\_\_\_\_

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.

	DATE COMPLETED	A/E SIGNOFF	REMARKS
1. The Notice of Approval of Occupancy/Use has been fully executed.			
2. Schedule for corrections, deficiencies, and items to be supplied are established by Contractor.			
3. Final Change Orders are processed (work must be completed prior to Notice of Acceptance).			
4. Punch list work is completed and accepted			
5. Permanent keying, keys and keying instructions have been performed.			
6. Extra materials as per specifications are delivered to Principal Representative.			
7. As-built drawings have been submitted to Architect/Engineer.			
8. Guarantee/Warranty documentation requirements are met.			
9. Five Most Costly Goods form is completed by Contractor and received			
10. Removal of Contractor's temporary work including cleanup and debris removal.			
11. State personnel are instructed in system and equipment operations as required by contract.			
12. All Instructions, manuals, guides, and charts have been transmitted to Principal Representative.			

Architect/Engineer \_\_\_\_\_ Date \_\_\_\_\_

Contractor \_\_\_\_\_ Date \_\_\_\_\_

State Buildings Programs \_\_\_\_\_ Date \_\_\_\_\_  
(or Authorized Delegate)

Principal Representative \_\_\_\_\_ Date \_\_\_\_\_  
(Institution or Agency)

## **SECTION 00 65 19.26 – NOTICE OF FINAL ACCEPTANCE**

### **PART 1 - GENERAL**

- 1.1 RELATED DOCUMENTS (Not Applicable)
- 1.2 SUMMARY (Not Applicable)
- 1.3 DEFINITIONS (Not Applicable)
- 1.4 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.
- 1.5 PROCEDURE (Not Applicable)

### **PART 2 - PRODUCTS (Not Applicable)**

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

**END OF SECTION 00 65 19.26**



STATE OF COLORADO  
OFFICE OF THE STATE ARCHITECT  
STATE BUILDINGS PROGRAM

**NOTICE OF FINAL ACCEPTANCE**

---

Date of Notice of Acceptance: \_\_\_\_\_  
Date to be inserted by A/E after consultation with the Principal Representative

Institution/Agency: \_\_\_\_\_

Project No./Name: \_\_\_\_\_

---

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**

#### **1.1 RELATED DOCUMENTS**

#### **1.2 SUMMARY**

#### **1.3 DEFINITIONS**

#### **1.4 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.

#### **1.5 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: \_\_\_\_\_  
Notice Number: \_\_\_\_\_  
Project No./Title: \_\_\_\_\_

---

Notice is hereby given that on date \_\_\_\_\_ at address \_\_\_\_\_ Colorado, final settlement will be made by the STATE OF COLORADO with vendor name \_\_\_\_\_, 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 72 53 – CONTRACT GENERAL CONDITIONS (D/B/B)**

**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 CONTRACT GENERAL CONDITIONS FOR D/B/B AGREEMENT

- A. State of Colorado form “The General Conditions of the Contractor’s Design/Bid/Build (D/B/B) Agreement” (SC-6.23) dated 7/2021.
- 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 72 53**



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



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

---

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)

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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)**

**ARTICLE 1. DEFINITIONS**

**CONTRACT DOCUMENTS**

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

1. Contractor's Design/Bid/Build Agreement; (SC-6.21);
2. Performance Bond (SC-6.22) and Labor and Material Payment Bond (SC-6.221);
3. General Conditions of the Contractor's Design/Bid/Build Agreement (SC- 6.23) and if applicable, Supplementary General Conditions;
4. Detailed Specification Requirements, including all addenda issued prior to the opening of the bids; and,
5. Drawings, including all addenda issued prior to the opening of the bids.
6. Change Orders (SC-6.31) and Amendments (SC-6.0), if any, when properly executed.
7. Authorization to Bid (SBP-6.10)
8. Information for Bidders (SBP-6.12);
9. Bid (SBP-6.13);
10. Bid Bond (SBP-6.14);
11. Notice of Award (SBP-6.15);
12. Builder's risk insurance certificates of insurance (ACORD 25-S);
13. Liability and Workers' compensation certificates of insurance;
14. Notice to Proceed (Design/Bid/Build) (SBP-6.26);
15. Notice of Approval of Occupancy/Use (SBP-01);
16. Notice of Partial Substantial Completion (SBP-071);
17. Notice of Substantial Completion (SBP-07);
18. Notice of Partial Final Acceptance (SC-6.27);
19. Notice of Final Acceptance (SBP-6.271);
20. Notice of Partial Contractor's Settlement (SC-7.3);
21. Notice of Contractor's Settlement (SBP-7.31);
22. Application and Certificate for Contractor's Payment (SBP-7.2);
23. 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.

**DEFINITIONS OF WORDS AND TERMS USED**

1. **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
2. **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.

3. 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.
4. CHANGE ORDER. The term "Change Order" means a written order directing the Contractor to make changes in the Work, in accordance with Article 35A, The Value of Changed Work.
5. 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.
6. 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
7. 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.
8. 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.
9. 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 35D 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 35D.
10. 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.
11. 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.
12. 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.
13. OCCUPANCY. The term "Occupancy" 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.

14. OWNER. The term "Owner" shall mean the Principal Representative.
15. 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.
16. PRODUCT DATA. The term "Product Data" shall mean all submittals in the form of printed manufacturer's literature, manufacturer's specifications, and catalog cuts.
17. 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.
18. 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.
19. SAMPLES. The term "Samples" shall mean examples of materials or Work provided to establish the standard by which the Work will be judged.
20. 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).
21. 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).
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. 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.

28. **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.
29. **SUPPLIER.** The term “Supplier” shall mean any manufacturer, fabricator, distributor, material man or vendor.
30. **SURETY.** The term “Surety” shall mean the company providing the labor and material payment and performance bonds for the Contractor as obligor.
31. **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.
32. **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.

## **ARTICLE 2. EXECUTION, CORRELATION, INTENT OF DOCUMENTS, COMMUNICATION AND COOPERATION**

### **A. EXECUTION**

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

1. Execute the Agreement, State Form SC-6.21;
2. Furnish fully executed Performance and Labor and Material Payment Bonds on State Forms SC-6.22 and SC-6.221; and
3. Furnish certificates of insurance evidencing all required insurance on standard Acord forms designed for such purpose.
4. Furnish certified copies of any insurance policies requested by the Principal Representative.
5. 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 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;

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.

### **C. 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:

1. The Agreement (SC-6.21);
2. The Supplementary General Conditions, if any;
3. The General Conditions (SC-6.23); and
4. 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.

#### D. 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.

**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.

**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.

**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.

**ARTICLE 6. ARCHITECT/ENGINEER DECISIONS AND JUDGMENTS, ACCESS TO WORK AND INSPECTION**

**A. 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.

**B. 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.

C. 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.

D. 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:

1. Compaction testing reports based upon the findings and recommendations of the Principal Representative's testing consultant;
2. Bearing surfaces of excavations before concrete is placed based upon the findings and recommendations of the Principal Representative's soils engineering consultant;
3. Reinforcing steel after installation and before concrete is poured;
4. Structural concrete;
5. Laboratory reports on all concrete testing based upon the findings and recommendations of the Principal Representative's testing consultant;
6. Structural steel during and after erection and prior to its being covered or enclosed;
7. Steel welding; Principal Representative will furnish steel welding inspection consultant/agency if required or necessary for the project;
8. Mechanical and plumbing Work following its installation and prior to its being covered or enclosed;
9. Electrical Work following its installation and prior to its being covered or enclosed; and
10. 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.

## **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.

## **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.

## **ARTICLE 9. SURVEYS, PERMITS, LAWS, TAXES AND REGULATIONS**

### **A. SURVEYS**

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

### **B. 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.

**C. TAXES**

**1. 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.

**2. 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.

**D. 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.

**ARTICLE 10. PROTECTION OF WORK AND PROPERTY**

**A. 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:

1. Directly due to errors in the Contract Documents;
2. Caused by agents or employees of the Principal Representative; and,
3. 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;

**B. 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.

**C. 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.

**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.

**ARTICLE 12. REQUESTS FOR INFORMATION AND SCHEDULES**

**A. 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.

## B. SCHEDULES

### 1. 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.

### 2. 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:

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

### 3. 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.

### **ARTICLE 13. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES**

#### **A. 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.

#### **B. 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.

C. **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.

D. **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.

**ARTICLE 14. SAMPLES AND TESTING**

A. **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.

B. **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.

C. **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.

**D. 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.

**ARTICLE 15. SUBCONTRACTS**

**A. 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)

**B. 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.

**C. 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.

**D. 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.

#### **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.

#### **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 52C, Indemnification, provided the Contractor was given due Notice of an opportunity to settle.

#### **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.

#### **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.

#### **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.

## **ARTICLE 21. UTILITIES**

### **A. 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 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.

### **B. 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.

### **C. 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.

## **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.

## **ARTICLE 23. TEMPORARY FACILITIES**

### **A. 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.

### **B. 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.

C. **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.

D. **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.

E. **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.

F. **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.

G. **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.

**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.

**ARTICLE 25. INSURANCE**

A. **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".

B. 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:

1. Per project general aggregate (CG 25 03 or similar)
2. 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.
3. The policy shall be endorsed to be **primary and non-contributory** with any insurance maintained by Additional Insureds.
4. A waiver of Subrogation in favor of all Additional Insured parties.
5. Personal Injury Liability
6. Contractual Liability coverage to support indemnification obligation per Article 53.I
7. Explosion, collapse and underground (xcu)

The following exclusionary endorsements are prohibited in the CGL policy:

1. Damage to Work performed by Subcontract/Vendor (CG 22-94 or similar)
2. 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)
3. If applicable to the Work to be performed: Residential or multi-family
4. If applicable to the Work to be performed: Exterior insulation finish systems
5. 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.

C. AUTOMOBILE LIABILITY INSURANCE 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
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Coverages:  
Specific waiver of subrogation

D. 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.

E. 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.

Each occurrence	\$5,000,000
Aggregate	\$5,000,000

F. 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.

**G. 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.

**H. 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:

1. 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;
2. 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 hereinbefore 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;
3. 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;
4. 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.

**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.

**ARTICLE 27. LABOR AND WAGES**

- A. 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.

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

1. 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.
  - a. 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.
2. 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.
3. The contractor and any subcontractors shall prepare and submit payroll reports to the State on a monthly basis that disclose all relevant payroll information, including the name and address of any entities to which fringe benefits are paid.
4. 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.
5. 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:
  - a. 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.
  - b. 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.

#### **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 52C, 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.

#### **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 service 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.

#### **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.

#### **ARTICLE 31. APPLICATIONS FOR PAYMENTS**

##### **A. 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.

##### **B. 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.

**C. 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 31D, 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.

**D. 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.

**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.

#### **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:

1. Defective Work not remedied;
2. Claims filed or reasonable evidence indicating probable filing of claims;
3. Failure of the Contractor to make payments to Subcontractors for material or labor;
4. A reasonable doubt that the Contract can be completed for the balance of the contract price then unpaid;
5. Damage or injury to another contractor or any other person, persons or property except to the extent of coverage by a policy of insurance;
6. 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;
7. Failure to submit a monthly construction schedule;
8. Failure of the Contractor to keep Work progressing in accordance with the time schedule;
9. Failure to keep a superintendent on the Work;
10. Failure to maintain as built drawings of the Work in progress;
11. Unauthorized deviations by the Contractor from the Contract Documents; or
12. 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.

#### **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.

#### **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 35C, 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.

**A. THE VALUE OF CHANGED WORK**

1. 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.
2. 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.
3. Except as otherwise provided in Article 35B, 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.

**B. 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:

1. 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).
2. 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.



3. Costs of project management time and superintendence 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 superintendence time is directly attributable to and required by the change; provided however that additional cost of on-site superintendence 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.
4. 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.
5. Workers' compensation costs, if not included in labor burden.
6. 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.
7. Overhead and profit, as hereafter specified.
8. Builder's risk insurance premium costs.
9. Bond premium costs.
10. Testing costs not otherwise excluded by these General Conditions.
11. Subcontract costs.

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

	OVERHEAD	PROFIT	COMMISSION
To the Contractor or to Subcontractors for the portion of Work performed with their own forces:	10%	5%	0%
To the Contractor or to Subcontractors for Work performed by others at a tier immediately below either of them:	5%	0%	5%

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 1 through 11 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 35A1 and 35A2 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 35A, 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.

C. HAZARDOUS MATERIALS

1. 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.
2. 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.
3. **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.**

D. 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 35A, 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.

E. **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.

**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 2D, 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 6A and B, 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.A.2 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 35A, 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 35A, 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 35B, 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 35B, Detailed Breakdown, determined solely with reference to the additional Work, if any, required by the change.

### **ARTICLE 37. DIFFERING SITE CONDITIONS**

#### **A. 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:

1. 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,
2. 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.

**B. LIMITATIONS**

No claim of the Contractor under this clause shall be allowed unless the Contractor has given the Notice required in Article 37A, 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 41A, Notice Of Completion.

**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 12B, 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.

### **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:

1. 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;
2. 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);
3. 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;
4. a party shall review any meeting agenda proposed by a facilitator and endeavor to be informed on the subjects to be discussed;

5. 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;
6. 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;
7. 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;
8. each party shall be obligated to participate in negotiations requested by the other party and to perform the specific obligations described in paragraphs (1) through (10) this Article 39, Facilitated Negotiation, no more than three times during the course of the Project;
9. 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,
10. 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 52F, 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 2D, 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.

#### **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.

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

##### **A. 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.

**B. 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:

1. Work to be completed, if any; and
2. 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:

1. Work to be completed, if any;
2. Work not in compliance with the Drawings or Specifications, if any; and
3. 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.

**C. 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:

1. 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;
2. 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;
3. 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;

4. 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
5. 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.

#### D. 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.

#### E. 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:

1. 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.
2. Demonstrated to the operating personnel of the Principal Representative the proper operation and maintenance of all equipment.
3. Delivered to the State of Colorado Department of Personnel & Administration in accordance with the Colorado Procurement Code or the applicable procurement code for institutions of higher education:
  - a. 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.

#### **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.

#### **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.

#### **ARTICLE 44. ONE-YEAR GUARANTEE AND SPECIAL GUARANTEES AND WARRANTIES**

##### **A. 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.

**B. 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.

**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 7A (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.

**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 su

bstantially 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.

#### **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.

#### **ARTICLE 48. STATE'S RIGHT TO DO THE WORK; TEMPORARY SUSPENSION OF WORK; DELAY DAMAGES**

##### **A. 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.

##### **B. 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:

1. Unsuitable weather;

2. Faulty Workmanship;
3. Improper superintendence or project management;
4. Contractor's failure to carry out orders or to perform any provision of the Contract Documents;
5. Loss of, or restrictions to, appropriations;
6. 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.

C. **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.

**ARTICLE 49. STATE'S RIGHTS TO TERMINATE CONTRACT**

A. **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 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, 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.



**B. CONDITIONS AND PROCEDURES**

1. 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.
2. 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 B(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.
3. 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 48A, 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.

**C. 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.

**ARTICLE 50. TERMINATION FOR CONVENIENCE OF STATE**

**A. 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.

## B. 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:

1. 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,
2. 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:

- a. completed or partially completed plans, Drawings and information; and,
- 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.

#### **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.

#### **ARTICLE 52. SPECIAL PROVISIONS**

**A. 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.

**B. 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.

**C. 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, C.R.S. § 24-10-101 et seq.; 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.

**D. 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 (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 State, and (c) be solely responsible for its acts and those of its employees and agents.**

**E. 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.

**F. 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.

**G. 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 C.R.S. §24-106-109. Any term included in this Contract that limits Contractor's liability that is not void under this section shall apply only in excess of any insurance to be maintained under this Contract, and no insurance policy shall be interpreted as being subject to any limitations of liability of this Contract.

**H. 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.

**I. EMPLOYEE FINANCIAL INTEREST/CONFLICT OF INTEREST C.R.S. § 24-18-201 & 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's services and Contractor shall not employ any person having such known interests.

**J. VENDOR OFFSET AND ERRONEOUS PAYMENTS C.R.S. § 24-30-202(1) & C.R.S. § 24-30-202.4**

The State Controller may withhold payment under the State's vendor offset intercept system for debts owed to State Agencies for: **(a)** unpaid child support debts or child support arrearages; **(b)** unpaid balances of tax, accrued interest, or other charges specified in §39-21-101, et seq. C.R.S.; **(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 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.

K. PUBLIC CONTRACTS FOR SERVICES. C.R.S. § 8-17.5-101.

Contractor certifies, warrants, and agrees that it does not knowingly employ or contract with an illegal alien who will perform work under this Contract and will confirm the employment eligibility of all employees who are newly hired for employment in the United States to perform work under this contract, through participation in the E-Verify Program or the Department program established pursuant to C.R.S. § 8-17.5-102(5)(c), Contractor shall not knowingly employ or contract with an illegal alien to perform work under this Contract or enter into a contract with a subcontractor that fails to certify to Contractor that the subcontractor shall not knowingly employ or contract with an illegal alien to perform work under this Contract. Contractor **(a)** shall not use E-Verify Program or Department program procedures to undertake pre-employment screening of job applicants while this Contract is being performed, **(b)** shall notify the subcontractor and the contracting State Agency within three days if Contractor has actual knowledge that a subcontractor is employing or contracting with an illegal alien for work under this Contract, **(c)** shall terminate the subcontract if a subcontractor does not stop employing or contracting with the illegal alien within three days of receiving the notice, and **(d)** shall comply with reasonable requests made in the course of an investigation, undertaken pursuant to C.R.S. § 8-17.5-102(5), by the Colorado Department of Labor and Employment. If Contractor participates in the Department program, Contractor shall deliver to the contracting State Agency, Institution of Higher Education or political subdivision a written, notarized affirmation, affirming that Contractor has examined the legal work status of such employee, and shall comply with all of the other requirements of the Department program. If Contractor fails to comply with any requirement of this provision or C.R.S. § 8-17.5-101 et seq., the contracting State Agency, Institution of Higher Education or political subdivision may terminate this Contract for breach and, if so terminated, Contractor shall be liable for damages.

L. PUBLIC CONTRACTS WITH NATURAL PERSONS. C.R.S. § 24-76.5-101.

Contractor, if a natural person eighteen (18) years of age or older, hereby swears and affirms under penalty of perjury that Contractor **(a)** is a citizen or otherwise lawfully present in the United States pursuant to federal law, **(b)** shall comply with the provisions of C.R.S. § 24-76.5-101 et seq., and **(c)** has produced one form of identification required by C.R.S. § 24-76.5-103 prior to the effective date of this Contract.

**ARTICLE 53. MISCELLANEOUS PROVISIONS**

A. CONSTRUCTION OF LANGUAGE

The language used in these General Conditions shall be construed as a whole according to its plain meaning, and not strictly for or against any party. Such construction shall, however, construe language to interpret the intent of the parties giving due consideration to the order of precedence noted in Article 2C, Intent of Documents.

B. SEVERABILITY

Provided this Agreement can be executed and performance of the obligations of the Parties accomplished within its intent, the provisions hereof are severable and any provision that is declared invalid or becomes inoperable for any reason shall not affect the validity of any other provision hereof, provided that the Parties can continue to perform their obligations under this Agreement in accordance with its intent.

C. SECTION HEADINGS

The captions and headings in this Agreement are for convenience of reference only, and shall not be used to interpret, define, or limit its provisions.

D. AUTHORITY

Each person executing the Agreement and its Exhibits in a representative capacity expressly represents and warrants that he or she has been duly authorized by one of the parties to execute the Agreement and has authority to bind said party to the terms and conditions hereof.

E. INTEGRATION OF UNDERSTANDING

This Contract is intended as the complete integration of all understandings between the parties and supersedes all prior negotiations, representations, or agreements, whether written or oral. No prior or contemporaneous addition, deletion, or other amendment hereto shall have any force or effect whatsoever, unless embodied herein in writing. No subsequent novation, renewal, addition, deletion, or other amendment hereto shall have any force or effect unless embodied in a written Change Order or Amendment to this Contract.

F. NO THIRD PARTY BENEFICIARIES

Enforcement of this Agreement 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 the Contract, and do not create any rights for such third parties.

G. WAIVER

Waiver of any breach under a term, provision, or requirement of this Agreement, or any right or remedy hereunder, whether explicitly or by lack of enforcement, shall not be construed or deemed as a waiver of any subsequent breach of such term, provision or requirement, or of any other term, provision, or requirement.

H. INDEMNIFICATION

Contractor shall indemnify, save, and hold harmless the State, its employees and agents, against any and all claims, damages, liability and court awards including costs, expenses, and attorney fees, to the extent such claims are caused by any negligent act or omission of the Contractor, its employees, agents, subcontractors or assignees pursuant to the terms of this Contract, but not to the extent such claims are caused by any negligent act or omission of, or breach of contract by, the State, its employees, agents, other contractors or assignees, or other parties not under control of or responsible to the Contractor.

I. STATEWIDE CONTRACT MANAGEMENT SYSTEM

If the maximum amount payable to Contractor under this Contract is \$100,000 or greater, either on the Effective Date or at any time thereafter, this shall apply. Contractor agrees to be governed by and comply with the Colorado Procurement Code or the applicable procurement code for institutions of higher education, regarding the monitoring of vendor performance and the reporting of contract performance information in the State's contract management system ("Contract Management System" or "CMS"). Contractor performance shall be subject to evaluation and review in accordance with the terms and conditions of this Contract, Colorado statutes governing CMS, and State Fiscal Rules and State Controller policies.

J. CORA DISCLOSURE

To the extent not prohibited by federal law, this Agreement and the performance measures and standards under the Colorado Procurement Code or the applicable procurement code for institutions of higher education, if any, are subject to public release through the Colorado Open Records Act, C.R.S. § 24-72-201, et seq.

## **SECTION 00 73 01 – SUPPLEMENTARY GENERAL CONDITIONS (D/B/B)**

### **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 SUPPLEMENTARY GENERAL CONDITIONS

- A. The University of Colorado Denver | Anschutz Medical Campus Supplementary General 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 01**

# **UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS**

## **SUPPLEMENTARY GENERAL CONDITIONS**

For Design Bid Build Contractor Agreement and General Conditions of the Contract  
(SC6.21 and SC6.23)  
**for the Anschutz Medical Campus and Denver Campus**

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APPENDIX A University of Colorado Denver | Anschutz Medical Campus Tax Information



ARTICLE 25. INSURANCE – Replace Article 25 as follows:

The term University, University of Colorado, University of Colorado Denver, University of Colorado Anschutz Medical Campus, CU Denver, CU Anschutz, Principal Representative, are the interchangeable for this replacement of article 25.

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.

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.

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

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

- Premises and Operations
- Explosions, Collapse and Underground Hazards
- Personal / Advertising Injury
- Products / Completed Operations
- Liability assumed under an Insured Contract (including defense costs assumed under contract)
- Independent Contractors
- Designated Construction Projects(s) General Aggregate Limit, ISO CG 2503 (1997 Edition)
- Additional Insured—Owners, Lessees or Contractors Endorsement, ISO Form 2010 (2004 Edition or equivalent)
- Additional Insured—Owners, Lessees or Contractors Endorsement (Completed Operations), ISO CG 2037 (7/2004 Edition or equivalent)
- **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”.**
- 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.
- **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.**

Liability Limits	General Aggregate	Products/Completed Operation Aggregate	Each Occurrence	Personal/Advertising Injury
Primary General Liability	\$2,000,000	\$2,000,000	\$1,000,000	\$1,000,000
Umbrella or Excess Liability*	\$5,000,000	\$5,000,000	\$5,000,000	\$5,000,000

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

**The following exclusionary endorsements are prohibited in the CGL policy:**

1. Damage to work performed by subcontract/vendor (CG 22-94 or similar);
2. Contractual liability coverage exclusion modifying or deleting the definition of an "insured contract";
3. If applicable to the work to be performed: Residential or multi-family;
4. If applicable to the work to be performed: Exterior insulation finish systems;
5. If applicable to the work to be performed: Subsidence or earth movement.

2. **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

3. **Workers Compensation**

- Statutory Benefits (Coverage A)
  - Employers Liability (Coverage B)
- a. Policy shall contain a waiver of subrogation in favor of the Principal Representative.
  - b. 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:**

Coverage A (Workers' Compensation)	Statutory
Coverage B (Employers Liability)	
Each accident	\$ 100,000
Disease each employee	\$ 100,000
Disease policy limit	\$ 500,000

4. **Contractors Pollution Liability**

- 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.
- 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.

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

5. **Professional Liability (Errors and Omissions)**

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

- 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."

- 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.
- 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

6. **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.

- Covered Cause of Loss: Special Form
- Include Theft and Vandalism
- Labor costs to repair damaged work

- Shall be written for 100% of the completed value (replacement cost basis)
  - Deductible maximum is \$50,000.00
  - Waiver of Subrogation is to apply
  - The Regents of the University of Colorado, a body corporate, shall be added as **Additional Named Insured on Builders Risk**.
1. 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.
  2. 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.
  3. 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.
  4. 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.
  5. The Builders' 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:
    - a. 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
    - b. Modify or delete exclusion pertaining to damage to interior of building caused by an perils 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***
  6. 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.
  7. 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.
  8. 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.

9. 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.

## **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).
9. Certificate Holder: The Regents of the University of Colorado, Project Management, 1945 North Wheeling Street, Campus Mail stop F-418, Aurora, CO 80045.

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.

#### **Subcontractors**

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.

(Revised 7-21-11)

#### **ARTICLE 41. COMPLETION, FINAL INSPECTION, ACCEPTANCE AND SETTLEMENT – Add the following**

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).

#### **ARTICLE 52. SPECIAL PROVISIONS -Add the following:**

M: 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 | Anschutz Medical Campus 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:

1. sexual advances; 2. requests for sexual favors; or 3. 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.

ARTICLE 53. MISCELLANEOUS PROVISIONS -Add the following:

- L. All costs and time associated with obtaining a University security badge for Contractor employees working on campus shall be borne by the Contractor.

**UNIVERSITY OF COLORADO DENVER | ANSCHUTZ MEDICAL CAMPUS  
SUPPLEMENTARY GENERAL CONDITIONS**

For Design Bid Build Contractor Agreement and General Conditions of the Contract (SC6.21 and SC6.23)

**APPENDIX A**

Tax Information:

1. Certificate of Exemption for State Sales/Use Tax, dated August 25, 2017
2. Sales Tax Exemption Certificate – Multi-Jurisdiction dated September 4, 2018
2. City of Aurora Sales and Use Tax Exemption, dated March 12, 2001
3. City of County of Denver Tax Confirming Exemption Status, dated November 5, 1999
4. State of Colorado Letter Confirming Adams County, RTD, Stadium, and Cultural Tax Exemptions, dated April 7, 2006
5. Colorado Department of Revenue - Contractor Application for Exemption Certification



CERTIFICATE OF EXEMPTION FOR STATE SALES/USE TAX ONLY

THIS LICENSE IS  
NOT TRANSFERABLE

USE ACCOUNT NUMBER for all references	LIABILITY INFORMATION		ISSUE DATE
09802565	G	010180	Aug 25 2017



STATE OF COLORADO/ OFFICE OF STATE  
CONTROLLER  
ATTN: OFFICE OF UNIVERSITY CONTROLLER  
1800 N GRANT ST STE 600  
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	
<b>I Certify That</b>				
Name of Firm (Buyer) The Regents of University of Colorado				
Address 1800 Grant Street, Suite 600				
City Denver		State CO	ZIP 80203	
<b>Qualifies As (Check each applicable item)</b>				
<input type="checkbox"/> Wholesaler <input type="checkbox"/> Retailer <input type="checkbox"/> Manufacturer <input type="checkbox"/> Charitable or Religious				
<input checked="" type="checkbox"/> Political Subdivision or Governmental Agency <input type="checkbox"/> 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 <u>Institution of Higher Education</u> or				
2) that such purchases are exempt from payment of sales or use tax in such states and cities because our buyer is:				
<input checked="" type="checkbox"/> Political Subdivision or Governmental Agency <input type="checkbox"/> Charitable or Religious <input type="checkbox"/> 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 Colorado (Boulder campus)	State Registration or ID Number 98-02915-0000	
City or State Colorado	State Registration or ID Number 98-02565-0000	City or State Texas	State Registration or ID Number 32002730391	
City or State	State Registration or ID Number	City or State	State Registration or ID Number	
<b>If the list of states and cities is more than six(6), attach a list to this certificate.</b> 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) <i>Robert C. Kuehn</i>		Title Associate Vice President/University Controller		Date (MM/DD/YY) 7/4/18



FINANCE DEPARTMENT

Administration  
1470 South Havana Street  
Aurora, Colorado 80012  
303-739-7055  
FAX: 303-739-7068

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

Wayne F. Henderson  
March 12, 2001  
Page Two

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)(a).* 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



**Department of Finance**  
Treasury Division  
Tax Compliance – Audit Unit  
  
201 W Colfax Ave #1009  
Denver, CO 80202  
fax: 720-913-9455  
[www.denvergov.org/treasury](http://www.denvergov.org/treasury)

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,

Donald Korte, Audit Manager  
Tax Compliance/Audit Section  
720-913-9339

# STATE OF COLORADO

## TAXPAYER SERVICE DIVISION

Department of Revenue

1375 Sherman Street  
Denver, Colorado 80261



Bill Owens  
Governor

M. Michael Cooke  
Executive Director

Neil Tillquist  
Division Director

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,

A handwritten signature in cursive script that reads "Steve Asbell".

Steve Asbell

Taxpayer Service Policy Group

Colorado Dept of Revenue

Ph:303.866.3889 email: sasbell@spike.dor.state.co.us





## 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.



DR 0172 (05/01/18)  
**COLORADO DEPARTMENT OF REVENUE**  
Denver CO 80261 - 0009  
(303) 238-SERV (7378)

## 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.**

Contractor/Account No. <b>89-</b>		Period (MM/YY-MM/YY)	
<b>Must be completed by applicant</b>			
<b>Contractor Information</b>			
Trade name/DBA			
Owner, partner or corporate last name		First Name	Middle Initial
Mailing Address	City	State	Zip
E-Mail Address	FEIN	Bid amount for your contract (Must match to the penny) \$	
Fax number	Business Phone number		
Colorado withholding tax account number (See instructions)	<input type="checkbox"/> Subsidiary	<input type="checkbox"/> Subcontractors	<input type="checkbox"/> Staffing Agency
<input type="checkbox"/> No employees/subcontractors (see below)			
No Employees/Subcontractors. (Provide explanation or attach a letter of explanation).			
<b>Exemption Information</b> Copies of contract or agreement page, identifying the contracting parties, bid amount, type of work, and signatures of contracting parties <b>must</b> be attached			
Name of exempt organization (as show on contract)		Exempt organization's number <b>98</b>	
Address of exempt organization	City	State	Zip
Principal contact at exempt organization-Last Name		First Name	Middle Initial
Housing Authority (if applicable)	Name of Project (if applicable)		
Owner of the Project (if applicable)			
Physical location of project site (give actual address when applicable and Cities and/or County (ies) where project is located)			
City	State	Zip	Principal contact's telephone number
Scheduled construction start date (MM/DD/YY)		Estimated completion date (MM/DD/YY)	
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/YY)



## **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 for DIVISION 00 & 01:
  - a. Include all DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS campus standards as applicable per the default inclusion matrix show in DIVISION 010000 – TABLE OF CONTENTS for the correct project type.
  - b. Include all DIVISION 01 – GENERAL REQUIREMENTS campus standards as outlined in the DIVISION 010000 – TABLE OF CONTENTS. Coordinate with University Project Manager to determine applicability of each Division and any necessary modifications.

### **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.
6. University-furnished, Contractor-installed products.
7. Access to site.
8. Coordination with occupants.
9. Work restrictions.
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**

- A. Project Identification: PN 23-109856 CU Anschutz AES Radio System Upgrade.

1. Project Location: University of Colorado Anschutz Medical Campus at Fitzsimons, Aurora, CO 80045.

- B. Principal Representation: University of Colorado Denver.

1. University's Representative: Gregory Filpus (GREGORY.FILPUS@CUANSCHUTZ.EDU).

- C. Architect/Engineer: Jace Horak (JACE@TLHFIRE.COM).

#### 1.4 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and, in summary, briefly consists of the following:
1. The CU Anschutz campus is currently equipped with EST fire alarm control panels throughout twenty-nine buildings. Primary off-site reporting is established through a telephone line connected to a managed facilities-based voice network. This scope includes the work associated for establishing a new AES Radio network which communicates to the existing Remote Monitoring Alarm Service, providing AES Radio receiving equipment in the campus dispatch office and for 10% facility testing to commission the AES radio that will transmit zone signals. Reporting will be by zone. Special coordination is required with facility for work scheduling, specifically in restricted areas. Work may not be completed in the facility until schedule is coordinated and accepted by CU Anschutz.
  2. 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.
- B. Special considerations:
1. The contractor is responsible for completion and payment of CU requirements for working in this facility including:
    - a. Blood tests (Qfever baseline and post work) if working in restricted areas.
    - b. Mask fit – contractor is responsible for purchasing and providing their own masks if working in restricted areas.
    - c. CU Badging – contractor is responsible for badging fee (approx. \$15)
  2. The building will be occupied throughout the duration of the project. The existing system shall remain operational until new system cutover. The contractor is responsible for fire watch if required by the AHJ. The contractor is responsible for coordinating with CU for facility access. Work cannot be completed while lab research is in progress.

#### 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 UNIVERSITY-FURNISHED AND INSTALLED PRODUCTS

- A. University will furnish certain items of equipment/furnishings as shown on the Drawings. Contractor will be responsible for coordinating their work to accommodate these items including, but not limited to, physical space fit, utility connections and rough-in, power wiring and electrical characteristics.
- B. Include in Project scheduling the latest times when information for such items is required and so notify the University in writing.

#### 1.7 UNIVERSITY-FURNISHED, CONTRACTOR-INSTALLED PRODUCTS

- A. The University will furnish certain items delivered to the jobsite as shown on the drawings. Contractor will receive, unload, move, set in position, anchor and connect such items and put them into operating condition.
- B. The Contractor will be responsible for coordinating their work to accommodate these items including, but not limited to, physical space fit, utility connections and rough-in, power wiring and electrical characteristics.
- C. Include in Project scheduling the latest times when information for such items is required and so notify the University in writing.
- D. Cooperate with University in scheduling the delivery of these items and be responsible for accommodating their storage and protection in the building and their replacement or repair due to damage as a result of Contractor's operations.

#### 1.8 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 University "Procedure for Approval of Regulatory Signage, Traffic Control Devices and for Street Closures at the Anschutz Medical Campus" and "AMC Campus Street and Parking Lot Closure Request" available through University Project Manager.
  - 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 of Aurora for any disruption to or temporary closures of public city streets. Coordinate procurement of permits with Anschutz Medical Campus Liaison and University Project Manager.

D. Construction Parking:

1. General: Contractor must pay for all parking and, if available, may be assigned parking spaces in designated contractor parking lots. Parking in lots designated for visitors and patients is not permitted. Make arrangements for designated spaces and payment for long term parking with University Parking Services through the University Project Manager.
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. Direct policy question to the department at (303) 724-2555.
  - 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.

## 1.9 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.

#### 1.10 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 6:00 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 72 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.
- E. Use of Existing Elevators: Use "freight" elevators only and protect finishes during transport. Restrict use exclusively to time required to move construction materials.
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: Restrict use exclusively to time required to unload and move construction materials.
- 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 or on any adjacent property.
- 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.

## 1.11 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 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. 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.

1. Change Order Bulletin Form: State Form SC-6.311 available on the website of the Office of the State Architect.
  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.
1. Change Order Bulletin Form: State Form SC-6.311 available from the website of the Office of the State Architect.
  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.
1. Change Order Proposal Form: State Form SC-6.312 available from the website of the Office of the State Architect.
  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 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
  - 2. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

##### **1.3 DEFINITIONS**

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

##### **1.4 SCHEDULE OF VALUES**

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule. 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.

- 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. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. 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.
6. 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.
7. 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. Contractor's construction schedule (preliminary if not final).
  4. Products list (preliminary if not final).
  5. Schedule of unit prices.
  6. Submittal schedule (preliminary if not final).
  7. List of Contractor's staff assignments.
  8. List of Contractor's principal consultants.
  9. Copies of building permits.
  10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
  11. Initial progress report.
  12. Report of preconstruction conference.
- 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.
  9. Final liquidated damages settlement statement.

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.

## 1.5 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 with 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:

<u>ITEM</u>	<u>FURNISHED BY</u>	<u>MOUNTED BY</u>	<u>LOW VOLTAGE WIRED BY</u>	<u>POWER WIRED &amp; CONNECTED BY</u>	<u>LOW VOLTAGE CONTROL CONNECTED BY</u>
Equipment motors	I	MI	MI	EI	--
Motor starters, contactors and overload heaters	MI	EI	EI	EI	MI
Fused and unfused disconnect switches	EI**	EI**	EI**	EI	--
Manual operating switches, speed switches, push-button stations and pilot lights	MI	EI	EI	EI	EI
Duct detectors	EI	MI	MI	EI	MI
Control relays and transformers	MI	MI	MI	EI	MI
Thermostats, time switches*	MI	MI	MI	EI	MI
Temperature control panels	MI	MI	MI	EI	MI
Motor and solenoid valves, damper motors, PE and EP switches	MI	MI	MI	--	MI
Refrigeration equipment, cooling tower and controls	MI	MI	MI	EI	MI

Electric meters	EI	EI	EI	EI	MI
Steam meters	MI	MI	MI	MI	MI
Chilled water meters,	MI	MI	MI	MI	MI
Water meters	MI***	MI	MI	MI	MI
Natural Gas	MI	MI	MI	MI	MI
<p>I = Installer of equipment requiring electrical service  EI = Electrical Installer  MI = Mechanical Installer</p> <p>* Motor driven units which are controlled from line voltage automatic controls such as line voltage thermostats, float switches or time switches which conduct full load current of the motor shall be wired for both power and control circuit under the electrical contract. However, if the control device does not conduct full load current, then the responsibility shall be that set forth in the above schedule. (Example: a 208 volt, 3-phase, 3- wire motor requires 120 volt control. Electrical Installer shall furnish a 120 volt circuit for control and 208 volt circuit for power and wire the power circuit. Mechanical Installer shall wire the control circuit.)</p> <p>** Disconnects for AH units are factory mounted.</p> <p>***Building Service meter provided by Civil. Any sub meter provided by MI. Coordinate meter requirements with utility for remote monitoring by 23 09 00 – Instrumentation and Controls.</p>					

H. 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.

I. 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.

J. 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. 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.
  14. Space for response and signature by Architect/Engineer.
- 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.** 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 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:

- 1) Change Order Bulletin, Change Order Proposal and Change Orders.
  - 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. 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:
    - a. Contract Documents.
    - b. Options.
    - c. Related RFIs.
    - d. Related Change Orders.
    - e. Purchases.
    - f. Deliveries.
    - g. Submittals.
    - h. Review of mockups.
    - i. Possible conflicts.
    - j. Compatibility requirements.
    - k. Time schedules.
    - l. Weather limitations.
    - m. Manufacturer's written instructions.
    - n. Warranty requirements.
    - o. Compatibility of materials.
    - p. Acceptability of substrates.
    - q. Temporary facilities and controls.
    - r. Space and access limitations.
    - s. Regulations of authorities having jurisdiction.
    - t. Testing and inspecting requirements.
    - u. Installation procedures.
    - v. Coordination with other work.
    - w. Required performance results.
    - x. Protection of adjacent work.
    - y. 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.
- D. 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.
    - c. University Building Maintenance Operations 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. MS4 Storm Water and Water Quality monitoring.
  - e. Quality:
    - 1) Quality and work standards.
    - 2) Status of correction of deficient items.
    - 3) Progress cleaning.
    - 4) Field observations.
  - f. Status of submittals.
  - g. Status of RFIs.
  - h. Status of Changes including:
    - 1) Change Order Bulletins.
    - 2) Change Order Proposals.
    - 3) Change Orders.
    - 4) Pending claims and disputes.
  - 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.
- E. Pay Application and Schedule Review Meeting: Conduct review meeting monthly on or about the 25<sup>th</sup> of each month.

1. Attendees:
  - a. University Project Manager.
  - b. Architect/Engineer.
  - c. Contractor's Project Manager, Superintendant 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. Weekly project status reports.
  - 5. Material location reports.
  - 6. Site condition reports.
  - 7. 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.

##### **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 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.
- D. 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.
- E. Daily Construction Reports: Submit at weekly intervals.
- F. Material Location Reports: Submit at monthly intervals.
- G. Site Condition Reports: Submit at time of discovery of differing conditions.
- H. Special Reports: Submit at time of unusual event.

#### 1.5 QUALITY ASSURANCE

- A. 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 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.
12. Emergency procedures.
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. 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.

- C. 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.

## 2.4 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. 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.
- B. 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] Twenty photographs to show existing conditions adjacent to property before starting the Work.
  - 3. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- E. Periodic Construction Photographs: Take [20] Twenty 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] Twenty 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.
  - 6. List of Subcontractors.
  - 7. Schedule of Values.
  - 8. Inspection and test results.
  - 9. Closeout documents.

10. Coordination drawings.
11. Street and Storm Water Quality Management Plan.
12. Indoor Air Quality Management Plan.
13. Anschutz Medical Campus Street Services Request.

- C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.
- D. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

#### 1.4 ACTION SUBMITTALS

- A. Submittals: Refer to individual CSI divisions for additional submittal requirements. If CSI division submittal requirements does not fully cover project scope, contractor shall submittal product data, shop drawings, testing data, certifications, and additional information for all permanent materials and components.
- B. 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. 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.
  3. 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.

#### 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 AutoCAD format.
  - 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. 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.
- E. Options: Identify options requiring selection by Architect/Engineer.

- F. 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.
- G. Contractor Certification: On transmittal include Contractor's certification that information complies with Contract Document requirements.
- H. 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.
- I. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect/Engineer's action stamp.
- K. 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."
- L. 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. Send electronic submittals as PDF electronic files via email directly to CU Anschutz (CHAD.JELINEK@CUANSHCUTZ.EDU) and TLH Fire (JACE@TLHFIRE.COM).
    - a. Architect/Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
  - 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- 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.
6. Confirm compliance of Product Data with requirements of Contract Documents. Submit cover letter indicating Contractor's certification of compliance.
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 30 by 42 in sheets at 1/8<sup>th</sup> in scale.
- 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. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- O. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- P. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- Q. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- R. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- S. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

- T. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
1. Name of evaluation organization.
  2. Date of evaluation.
  3. Time period when report is in effect.
  4. Product and manufacturers' names.
  5. Description of product.
  6. Test procedures and results.
  7. Limitations of use.
- U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- W. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- X. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

## 2.2 DELEGATED-DESIGN SERVICES

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

## 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."
- 9) Comply with current "Asbestos-Contaminated Soil Management Standard Operating Procedure Document, University of Colorado Anschutz Medical Campus" during excavation operations.

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 EPA and CDPHE 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.

J. Coronavirus / COVID-19

1. Work in compliance with all current regulatory guidelines, CU Denver | Anschutz Medical Campus COVID-19 plan requirements, and university contractor COVID-19 plan requirements.
2. Contact the university project manager for the current COVID-19 contractor plan. Contractor to return a completed university COVID-19 contractor plan along with a company COVID-19 plan.
3. Contractor must receive plan acceptance from project manager prior to being granted access to the campus.
4. Plan requirements are evolving, the university project manager will provide additional updates as necessary.

**END OF SECTION 01 35 44**

## **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 25 00 "Substitution Procedures" for requests for substitutions.
  - 2. Section 01 42 00 "References" for applicable industry standards for products specified.
  - 3. 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.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product 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 discretions. 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:
  - 1. Construction layout.
  - 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.
  - 9. Correction of the Work.
- 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.
  - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- 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.
  1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
  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.
  - 9. Chemicals.

10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staining and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
18. Combustion.
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.
26. Unprotected storage.
27. Improper shipping or handling.
28. Theft.
29. Vandalism.

**END OF SECTION 01 73 00**

## SECTION 01 73 29

### CUTTING AND PATCHING

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. Section Includes: Administrative and procedural requirements for cutting and patching.

##### 1.3 DEFINITION

- A. "Cutting and patching" is defined to include but is not necessarily limited to the cutting and patching of nominally completed and previously existing work and replacement of ceiling tiles, in order to accommodate construction requirements; and is defined to exclude integral cutting and patching during the manufacturing, fabricating, erecting and installing process for individual units of work. Drilling the work to install fasteners and similar operations are excluded from the definition of cutting and patching.

##### 1.4 RESPONSIBILITIES

- A. Contractor shall be responsible for all cutting, fitting and patching required to complete the work or to:
  - 1. Make its several parts 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. Provide routine penetrations of non-structural surfaces for installation of electrical conduit.
- B. Refer to other sections of the specifications for specific cutting and patching requirements and limitations applicable to individual units of work.

##### 1.5 SUBMITTALS

- A. Proposals for Cutting and Patching: Where approval of procedures for cutting and patching is required before proceeding, submit a proposal describing procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Description of why cutting and patching cannot reasonably be avoided, how it will be performed, how structural elements will be affected, products to be used, firms and trades to perform the Work, approximate dates of the Work, and anticipated results in terms of variations from the work as originally completed (structural, operational, visual and other qualities of significance). List utilities that will be disturbed or otherwise affected by work, including those that will be out-of-service temporarily.

##### 1.6 QUALITY ASSURANCE

- A. Requirements for Structural Work: Do not cut and patch structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio.

- B. Operational and Safety Limitations: Do not cut and patch operational elements and safety-related components in a manner resulting in a reduction of capacities to perform in the manner intended or resulting in decreased operational life, increased maintenance, or decreased safety.
- C. Visual Requirements: Do not cut and patch construction exposed in occupied spaces, in a manner that would, in the Engineer's opinion, reduce the building's aesthetic quality, or result in visual evidence of the cutting and patching. Remove and replace work cut and patched in a visually unsatisfactory manner.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Before cutting existing surfaces examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding if unsafe or unsatisfactory conditions are encountered.

### 3.2 PREPARATION

- A. Temporary Support: Provide adequate support for work to be cut to prevent failure. Do not endanger other work.
- B. Protection:
  - 1. Provide adequate protection of other work during cutting-and-patching to prevent damage and provide protection of the work from adverse weather exposure.
  - 2. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
  - 3. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

### 3.3 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
- B. Cutting:
  - 1. Cut work by methods least likely to damage work to be retained and work adjoining. Review proposed procedure with original Installer where possible, and comply with his recommendations. Cut holes and slots neatly to size required and temporarily cover openings when not in use. In general, cut work with sawing and grinding tools, not with hammering and chopping tools. Core drill openings through concrete work. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces. Cut through concrete and masonry using a cutting machine such as a Carborundum saw or diamond core drill.
  - 2. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

C. Patching:

1. Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
2. Restore exposed finishes of patched areas and, where necessary, extend finish restoration onto retained work adjoining in a manner which will eliminate evidence of patching. Where a patch occurs in a smooth painted surface, extend final paint coat over the entire unbroken surface containing the patch.
3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials if necessary to achieve uniform color and appearance.
4. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.
5. Remove lay-in ceiling tiles and grid to facilitate work. Protect and store tiles for reinstallation. Reinstall grid and tiles at the conclusion of the work day. Replace any damaged tiles with new matching tiles.

3.4 CLEANING

- A. Thoroughly clean areas and spaces where work is performed or used as access to work. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit, and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

**END OF SECTION 01 73 29**



## SECTION 01 74 19

### CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

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

##### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
  - 1. Salvaging nonhazardous demolition and construction waste.
  - 2. Recycling nonhazardous demolition and construction waste.
  - 3. Disposing of nonhazardous demolition and construction waste.

##### 1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

##### 1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of minimum 75 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:
  - 1. Demolition Waste:
    - a. Asphalt paving.

- b. Concrete.
- c. Concrete reinforcing steel.
- d. Brick.
- e. Concrete masonry units.
- f. Wood studs.
- g. Wood joists.
- h. Plywood and oriented strand board.
- i. Wood paneling.
- j. Wood trim.
- k. Structural and miscellaneous steel.
- l. Rough hardware.
- m. Roofing.
- n. Insulation.
- o. Doors and frames.
- p. Door hardware.
- q. Windows.
- r. Glazing.
- s. Metal studs.
- t. Gypsum board.
- u. Acoustical tile and panels.
- v. Carpet.
- w. Carpet pad.
- x. Demountable partitions.
- y. Equipment.
- z. Cabinets.
- aa. Plumbing fixtures.
- bb. Piping.
- cc. Supports and hangers.
- dd. Valves.
- ee. Sprinklers.
- ff. Mechanical equipment.
- gg. Refrigerants.
- hh. Electrical conduit.
- ii. Copper wiring.
- jj. Lighting fixtures.
- kk. Lamps.
- ll. Ballasts.
- mm. Electrical devices.
- nn. Switchgear and panelboards.
- oo. Transformers.

2. Construction Waste:

- a. Masonry and CMU.
- b. Lumber.
- c. Wood sheet materials.
- d. Wood trim.
- e. Metals.
- f. Roofing.
- g. Insulation.
- h. Carpet and pad.
- i. Gypsum board.
- j. Piping.
- k. Electrical conduit.
- l. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:

- 1) Paper.
- 2) Cardboard.
- 3) Boxes.
- 4) Plastic sheet and film.
- 5) Polystyrene packaging.
- 6) Wood crates.
- 7) Plastic pails.

#### 1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 30 calendar days of date established for the Notice to Proceed.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Use Form CWM-7 for construction waste and Form CWM-8 for demolition waste, as applicable. Include the following information:
  1. Material category.
  2. Generation point of waste.
  3. Total quantity of waste in tons.
  4. Quantity of waste salvaged, both estimated and actual in tons.
  5. Quantity of waste recycled, both estimated and actual in tons.
  6. Total quantity of waste recovered (salvaged plus recycled) in tons.
  7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

#### 1.7 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management 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 waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of waste management coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

## 1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Where Project includes demolition, distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste, as applicable, generated by the Work. Use Form CWM-1 for construction waste and Form CWM-2 for demolition waste. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Use Form CWM-3 for construction waste and Form CWM-4 for demolition waste. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
  1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
  2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
  3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

## PART 2 - PRODUCTS (Not Used)

## PART 3 - EXECUTION

### 3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with operation, termination, and removal requirements in Section 01 50 00 "Temporary Facilities and Controls."
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Based on Project size and complexity, waste management coordinator may, if approved in writing by Architect/Engineer and University Project Manager, serve in other construction related roles.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
  1. Distribute waste management plan to everyone concerned within three business days of submittal return.
  2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
  2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

### 3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
  1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  3. Store items in a secure area until installation.
  4. Protect items from damage during transport and storage.
  5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Not permitted on Project site.
- C. Salvaged Items for University's Use: Salvage items for University's use and handle as follows:
  1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
  3. Store items in a secure area until delivery to University.
  4. Transport items to University's storage area designated by University.
  5. Protect items from damage during transport and storage.
- D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
- E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

- F. Plumbing Fixtures: Separate by type and size.
- G. Lighting Fixtures: Separate lamps by type and protect from breakage.
- H. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.

### 3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
  - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - a. Inspect containers and bins for contamination and remove contaminated materials if found.
  - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
  - 4. Store components off the ground and protect from the weather.
  - 5. Remove recyclable waste from University's property and transport to recycling receiver or processor.

### 3.4 RECYCLING DEMOLITION WASTE

- A. Asphalt Paving: Grind asphalt to maximum 1-1/2-inch size.
  - 1. Crush asphaltic concrete paving and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as general fill.
- B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
  - 1. Pulverize concrete to maximum 1-1/2-inch size.
  - 2. Crush concrete and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as satisfactory soil for fill or subbase.
- D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
  - 1. Pulverize masonry to maximum 3/4-inch size.

- a. Crush masonry and screen to comply with requirements in Section 31 20 00 "Earth Moving" for use as satisfactory soil for fill or subbase.
  - b. Crush masonry and screen to comply with requirements in Section 32 93 00 "Plants" for use as mineral mulch.
- 2. Clean and stack undamaged, whole masonry units on wood pallets.
- E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- F. Metals: Separate metals by type.
  - 1. Structural Steel: Stack members according to size, type of member, and length.
  - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- H. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- J. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- K. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
  - 1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- L. Carpet Tile: Remove debris, trash, and adhesive.
  - 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- N. Conduit: Reduce conduit to straight lengths and store by type and size.

### 3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
  - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
  - 2. Polystyrene Packaging: Separate and bag materials.
  - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
  - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
  2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.
1. Clean Gypsum Board: If gypsum board is processed on site, grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding. At Contractor's option, processing may occur off site.

### 3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from University's property and legally dispose of them.

**END OF SECTION 01 74 19**



## **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.
  - 3. Certificate of Occupancy: Submit Certificate of Occupancy (CO) or Temporary Certificate of Occupancy (TCO).
  - 4. Final Completion Schedule: Submit schedule for performing and completing all work indicated on the Contractor's 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.
    - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
  - 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 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.

Activity	Date Completed	Remarks
1. Final and formal address posted on the building entries.		
2. A copy of the Contractor's in-progress red line "as-built" drawings has been given to BMO representative & a 2 <sup>nd</sup> copy is provided-for Projects plan room. This is to include landscape drawings showing irrigation installation.		
3. Maintenance, operations and spare parts manuals on all installed equipment.		
4. Notice of Partial Substantial Completion concerning roles/ responsibilities of University and Contractor for security, maintenance, heat, utilities reviewed and accepted.		
5. Manufacturer maintenance, operations and spare parts manuals for fixtures, mechanical, electrical and plumbing.		
6. Hardware-maintenance, operations and spare parts manuals for doors & locks, including roll up doors.		
7. Warranty Dates and Contact list for all Contractors and Suppliers given to BMO.		
8. Transfer utility account from Contractor to Facilities Operations.		
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.		
10. If Commissioning Report is completed, BMO has reviewed/ commented, including electrical, plumbing, mechanical/ HVAC.		
11. All Contractor provided equipment has new filters & construction filters removed.		
12. Not Used		
13. Elevator equipment rooms insulated and space conditioned for control system requirements.		
14. Testing Certifications provided to BMO for Elevators, Fire Systems & Annunciator Systems.		
15. FSS has been provided with copy of Building Department testing and inspection report for window washing equipment.		
16. Roof walking pads to access equipment are installed.		
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.		





## Supplemental Building / Project Acceptance List

Project Name & Number: \_\_\_\_\_

Contractor: \_\_\_\_\_

In addition to completing Pre-Acceptance Checklist (SBP-05), the following items must be completed before Final Acceptance.

Activity	Date Completed	Remarks
1. Review State Buildings Pre-Acceptance check list & Notice of Approval of Occupancy / use form with BMO rep & confirm agreement with status		
*2. Establish list of post construction change orders & track separately from basic project until items are complete – call it Phase 2 to avoid delay on basic project		
3. O & M Manuals given to BMO Representative and BMO Archivist (2 hard copies and 1 electronic total)		
*4. Record Documents – a hard copy of plans and specifications are provided for plan room & given to BMO & electronic auto cad & specs are given to Archive Officer (Art Steinman) this is to include landscape drawings showing irrigation installation.  Fire Alarm and suppression system shall have record drawings produced by the contractor and shall include PDFs and native graphic files, and CAD files include graphics maps and Fireworks graphics.		
*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.		
<b><u>*/**6. Move-related work items complete including physical move, tours (occupants &amp; police), mail, phone &amp; electrical hook ups for equipment &amp; furniture systems complete &amp; freezers enrolled in University freezer program.</u></b>		
7. If exterior work is applicable: Landscape – Include a walk through with University Grounds for 1) new & established 1-year service date; 2) existing damaged landscape is repaired; and 3) irrigation – zone control test is complete.		
8. Attic stock, matches spec. requirements, is located in secured location, and is inventoried.		
9. Electrical system one line diagram framed and mounted in electrical room.		
10. Spare fire suppression heads in cabinets and tool: cabinet in main electrical room includes one complete set of spare fuses for major equipment.		
11. Contractor keys issued by University BMO returned to University Key Shop via PM/ BMO Rep.		
12. Interior Finishes Binder given to the University Project Manager: (Two hard copies)		

13. Not Used		
14. Not Used		
15. Safety grating in pipe chases in place.		
16. Signs in place including monument sign, building exterior and site signage and building interior signage.		
17. 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.		
18. Not Used		
19. Not Used		
20. Not Used		
21. Not Used		
22. If commissioning is included for project, Commissioning Agent certification is received by BMO via PM and BMO Rep.		

\_\_\_\_\_  
University Project Manager  
(sign & print name)

\_\_\_\_\_  
Date

\_\_\_\_\_  
University BMO Rep.  
(sign & print name)

\_\_\_\_\_  
Date

\_\_\_\_\_  
University FSS  
(sign & print name)

\_\_\_\_\_  
Date

\_\_\_\_\_  
University Downtown Rep (if necessary)  
(sign & print name)

\_\_\_\_\_  
Date

\*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

3.1.12

## **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 SUBMITTALS**

- 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. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect/Engineer.

- a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
  - b. Compile entirely from documents with searchable text.
  - c. Enable inserted reviewer comments on draft submittals.
- 2. 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 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
  - 1. List of documents.
  - 2. List of systems.
  - 3. List of equipment.
  - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

### 2.2 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.
3. Manual 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, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size and enable OCR (optical character recognition) to provide searchable text.
2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

I. 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.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch, 20 lb., white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
  - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
  - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 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.
9. Automatic entrances.
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:

- a. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
    - 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.
  5. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.
- 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.

## 2.4 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.
  2. Cross-reference Specification Section number and title.
  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.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

## 2.5 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.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
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.

2.6      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

SECTION	TITLE	DESCRIPTION	QUANTITY
28 46 00	FIRE DETECTION AND ALARM	Initiating and Control Devices	Provide 1 spare AES radio

**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:
- a. Overview and theory.
  - b. Wiring diagrams, including the one line diagram.
  - c. Creation, editing, and programming of the point database.
  - d. Integration topology and platform for communication.
  - e. Graphics packages and touch screens for the system.
  - f. Alarms and diagnostics.
  - g. Reporting functions dynamically and historically.
  - h. Remote access to the system.
  - i. Database back-up and maintenance.
  - j. Replacement and re-programming of replacement parts.
  - k. Point type and functionality for each type of point.
  - l. Programming.
  - m. Point/object editing.
  - n. Loop tuning.
  - o. Help files and other troubleshooting documentation.

- p. 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

SECTION	TITLE	DESCRIPTION
28 46 00	FIRE DETECTION AND ALARM	Engage a factory-authorized service representative to train the University's Operations personnel a minimum of 8 hours for each system.

**END OF SECTION 01 79 00**

## **SECTION 07 80 00**

### **FIRE AND SMOKE PROTECTION**

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

##### **1.1 PRODUCTS AND MATERIALS:**

- A. Work in this Section is open to any product or material.

##### **1.2 PROJECT CRITERIA:**

- A. Work in this Division is to be performed by a single source specialized individual or firm for project meeting the following criteria:
  - 1. New construction and building additions, regardless of contract amount.
  - 2. Renovation/remodel involving more than 5,000 gross square feet.
  - 3. HVAC, plumbing, electrical, and communications projects involving more than 100 square inches of penetrations of fire-rated walls, floors or ceilings.

##### **1.3 DEFAULT STANDARDS:**

- A. In the absence of other information, standards of the following organizations apply: Underwriters Laboratories Fire Resistance Directory, current edition

##### **1.4 SUBMITTALS REQUIRED:**

- A. Product Data
- B. Shop drawings or schedule is preferred and mandatory for projects with total contract value exceeding \$1,000,000.
- C. Manufacturer instructions and Field Reports.

##### **1.5 CLOSEOUT:**

- A. All submittals listed above updated to Record status

##### **1.6 THERMAL AND MOISTURE PROTECTION:**

- A. Specify Underwriters Laboratories fire rated assembly designations in the contract documents
- B. Firestops are required at every construction joint and penetration in fire rated assemblies.
- C. Sprayed cementitious fireproofing as required per IBC.
  - 1. Minimum bond strength per ASTM E736: 200 psf
  - 2. Air erosion per ASTM 859: 0.00 grams loss
  - 3. Surface Burning per ASTM E84: Smoke = 0, Flame = 0, Fuel = 0

4. Use W/D ratio to determine application thickness
5. Remove paint, lubricant, compounds and other contaminants from substrate metal as recommended by the fireproofing manufacturer to assure specified bond strength.
6. Mineral fiber fireproofing is prohibited.

1.7 INSPECTION:

- A. CU reserves the right to perform a separate commissioning inspection and/or retain the services of an independent testing agency to inspect, sample, and confirm compliance with work in this section.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

**END OF SECTION 07 08 00**

## SECTION 26 00 00 - ELECTRICAL

### PART 1 - GENERAL

#### 1.1 DESIGN REQUIREMENTS

##### A. Branch Circuit Requirements:

1. Corridor receptacle circuits shall not be combined with office or laboratory receptacle circuits.
2. Housekeeping receptacle circuits shall not be combined with office or laboratory receptacle circuits. Provide separate housekeeping receptacles in laboratory Linear Equipment Rooms, clearly identified by an Orange duplex receptacle.
3. Offices shall have individual dedicated circuits as required for specific equipment. A maximum of 6 general purpose receptacles per 20A circuit is allowed.
4. Connect Laboratory receptacles in "Multi Outlet Assembly" (MOA) to alternating circuits (i.e. A, B, C, A, B, C). A maximum of 4 receptacles per 20A circuit is allowed.
5. Provide countertop receptacles in Laboratories with maximum two (2) foot on center spacing. Each outlet within 6 feet of a sink edge or water source shall be GFCI type. Protection via feed-thru GFI or GFCI breaker is not allowed.
6. Provide general receptacles in corridors no further than 50' apart.
7. Laboratory freezers such as -80 degree Celsius or similar equipment shall be provide at minimum with a dedicated 120V, 20A single 5-20 receptacle or as required per equipment. All receptacles shall be RED and connected to an emergency circuit.
8. Provide dedicated neutral conductors for all circuits.

##### B. Design Charette:

1. Design team shall schedule a Design Charette with the University Project Manager and facilities group at 100% Design Development phase and 50% Construction Document phase.
2. Charette shall include the following:
  - a. Electrical power distribution, including service entrance, standby system, riser closet locations and layouts.
  - b. Lighting design, including fixture layouts, egress lighting, fixture types, samples of specialty fixtures, accessibility for fixture maintenance and lighting controls.
  - c. Fire alarm design, including occupancy type, sequence of operations and interface with security systems.

##### C. Surge Suppression:

1. Provide integral Transient Voltage Surge Suppressors at the following locations:
  - a. Main Service Switchboards and Switchgear
  - b. Computer Laboratory Panel Boards
  - c. Information Services Panel Boards.
  - d. NMR Panelboards

##### D. Exterior Electrical Equipment:

1. Provide 15' minimum clearance around generators for maintenance access.
2. Provide ventilation for primary switching and exterior substations. Maintain positive elevation for exterior electrical equipment to protect against wet weather.
3. Provide exterior connections to a portable 500 kW generator for each building not provided with an emergency generator system. Provide kirk-key interlock for operation of generator system.

##### E. Provide a complete Lightning Protection System for each building.

##### F. Demolition:

1. Demolish all devices, conduit, wiring and associated equipment which do not remain in a remodel.
2. Completely remove all conduit, wiring, boxes, hangers, etc. back to the source.



3. Abandoned devices and equipment are not acceptable.
4. Recycle or dispose of all demolished items at a licensed facility.

G. Animal Facilities:

1. Provide redundant feeders to all distribution boards serving animal care facilities.
2. Provide 100% generator backup power for all systems serving the animal care facilities.
3. Provide all power and communication devices with weather proof covers. Mount devices at 42" AFF. Mount all devices in office areas at standard height without weather proof covers.
4. Provide cord reel centered in the ceiling between each row of cages.
5. Sharing power circuits between holding rooms is not acceptable.
6. Silicone seal all conduit wall penetrations. Internally seal all conduits after wiring has been pulled.
7. Provide emergency power off (EPO) capabilities for all branch feeders serving sterilizers. Locate EPO switch near the exit door, away from sterilizer.

H. Routing of electrical busway through chemical storage rooms is not acceptable.

I. Refer to Section 01 31 00 – Project Management and Coordination for additional details.

PART 2 - PRODUCTS

A. Not Applicable

PART 3 - EXECUTION

A. Not Applicable

**END OF SECTION 26 00 00**

## SECTION 26 05 00 - COMMON WORK RESULTS FOR ELECTRICAL

### PART 1 - GENERAL

#### 1.1 DESIGN REQUIREMENTS

#### 1.2 DEFINITIONS

- A. Refer to Article 100 of the currently adopted National Electrical Code for definitions as applicable to this project.
- B. Other definitions:
  - 1. "Concealed": Embedded in masonry, concrete or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces, or in enclosures.
  - 2. "Exposed": Not installed underground or "concealed" as defined above.
  - 3. "Furnish" or "Provide": To supply, install and connect up complete and ready for safe and regular operation of particular work unless specifically otherwise noted.
  - 4. "Install": To erect, mount and connect complete with related accessories.
  - 5. "Indicated", "Shown" or "Noted": As indicated, shown or noted on drawings or specifications.
  - 6. "Related Work" includes, but is not necessarily limited to, mentioned work associated with, or affected by, the work specified.
  - 7. "Reviewed", "Satisfactory", "Accepted", or "Directed": As reviewed, satisfactory, accepted, or directed by or to Engineer.
  - 8. "Similar": Equal in materials, weight, size, design, construction, capacity, performance, and efficiency of specified product.
  - 9. "Supply": To purchase, procure, acquire and deliver complete with related accessories.
  - 10. "Wiring": Raceway, fittings, wire, boxes and related items.

#### 1.3 SUBMITTALS

- A. Submittals shall be made in accordance with General Conditions of Contract and the requirements of Section 01 33 00.
- B. Shop drawings shall include equipment catalog cuts or manufacturer's printed data identifying: dimensions, weights, recess openings, equipment arrangements, electrical characteristics with bus size, electrical rating, material, wiring diagrams indicating circuit arrangement and NEMA rating for, but not limited to the following:
  - 1. Medium voltage distribution equipment, cable and devices (13.2 kv and above)
  - 2. Low-Voltage Transformers
  - 3. Switchboards
  - 4. Panel boards
  - 5. Motor Control Centers
  - 6. Enclosed Switches and Circuit Breakers
  - 7. Network Lighting Controls
  - 8. Automatic Transfer Switches
  - 9. UPS Equipment
  - 10. Contactors
  - 11. Wiring Devices
  - 12. Interior and Exterior Lighting
  - 13. Hangers and Supports for Electrical Systems
  - 14. Grounding and Bonding
  - 15. Multi-Outlet Assemblies
  - 16. Generators
  - 17. Modular Wiring Systems

18. Electrical Systems Control
19. Fire Detection and Alarm
20. Communication Systems
21. Lightning Protection System
22. Electronic Meters

- C. Submittals shall also include ¼" scale layouts of all electrical rooms, telecom rooms, fire alarm rooms and generator rooms. Include all equipment sizes and clearances.
- D. Submit composite coordination drawings to include location and routing of the electrical system components in relation to the mechanical ducts, piping and structural beams.

#### 1.4 QUALITY ASSURANCE

- A. Installer Qualifications: All electrical work at the University shall be performed by a State of Colorado licensed contractor under the supervision of a licensed electrician. Contractors shall verify that electricians are currently licensed by the State of Colorado and shall supply Project Manager with names and license numbers. Contractor shall have a minimum of 3 years of satisfactory performance in conducting the type of work specified.
  1. ANSI/NFPA 70 - National Electrical Code.
  2. ANSI/IEEE C2 - National Electrical Safety Code.
  3. NECA - Standard of Installation.
  4. NFPA – National Fire Protection Association.
  5. IEEE – The Institute of Electrical and Electronics Engineers.
  6. NEMA – National Electrical Manufacturer Association.
  7. The University/Anschutz Medical Campus Project Guidelines and Standards.
  8. International Building Code in accordance with the Campus Building Official.
  9. ASTM - American Society of Testing Materials
  10. IPCEA - Insulated Power Cable Engineers Association
  11. Underwriter's Laboratories (UL)
  12. American National Standards Institute (ANSI)
  13. Other requirements as listed elsewhere in these specifications.
- B. The drawings and specifications take precedence when they are more stringent than codes, statutes, or ordinances in effect. Applicable codes, ordinances, standards and statutes take precedence when they are more stringent than, or conflict with the drawings and specifications.
- C. Record Documents:
  1. Maintain a separate set of contract electrical drawings at the site in accordance with Section 01 74 00 to show the following:
    - a. Major raceway systems, size and location, for both exterior and interior; locations of control devices; distribution and branch electrical circuitry; and fuse and circuit breaker size and arrangements.
    - b. All branch circuits, feeders, communications conduits embedded in concrete, dimensioned from prominent building lines.
    - c. Equipment locations (exposed and concealed) dimensioned from prominent building lines.
    - d. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
- D. Operations and Maintenance Data:
  1. O and M Data shall be provided in accordance with Section 01 78 23 including the following information:
    - a. Description of function, normal operating characteristics and limitations, fuse curves, engineering data and tests, and complete nomenclature and commercial numbers of all replaceable parts.

- b. Manufacturer's printed operating procedures to include start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
- c. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
- d. Servicing instructions and lubrication charts and schedules.
- e. Complete list of parts and wiring diagrams.
- f. Names, addresses and telephone numbers of the Contractor, Sub-contractors and local company responsible for maintenance of each system or piece of equipment.
- g. All information shall be permanently bound in a 3-ring binder. The job name and address, and Contractor's name and address shall be placed on the cover and spine of each binder in a permanent manner. Dymo-tape is not acceptable.
- h. Copies of all test reports shall be included in the manuals.

#### 1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle products in accordance with manufacturer's instructions, and the requirements of Section 01 10 00.

#### 1.6 WARRANTY

- A. All electrical equipment, materials and workmanship warranties shall be provided in accordance with the requirements of Section 01 78 36 and the following:
  - 1. The Contractor warrants the electrical system, material and workmanship, for a period of one year from the date of the University final acceptance of the installation unless as otherwise noted in Commissioning.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS, GENERAL

- A. All equipment and materials installed shall be new, unless otherwise specified. Defective or damaged materials shall be replaced or repaired, prior to final acceptance, in a manner acceptable to the Engineer or The university and at no additional cost to the University.
- B. All electrical materials shall be acceptable for installation only if labeled or listed UL and, if accepted, by the authority having jurisdiction.
- C. All major equipment components shall have the manufacturer's name, address, model number, and serial number permanently attached in a conspicuous location.
- D. Fire Seals:
  - 1. Material: Fire stopping material shall be asbestos free, 100% intumescent, have code approval under BOCA, ICBO, SSBC, NFPA 101, NFPA 70, and be capable of maintaining an effective barrier against flame and gases in compliance with the following requirements.
  - 2. Flame Spread: 25 or less, ASTM E84
  - 3. Fire Resistance and Hose Stream Tests: Fire stopping materials shall be rated "F" and "T" in accordance with ASTM E 814 or UL 1479. Rating periods shall conform to the following:

(F)	3	(T)	3	Time-rated floor or wall assemblies.
(F)	3	(T)	3	Openings between floor slabs & curtain wall.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. Construct Work in sequence under provisions of Division 1 where applicable.
- B. Electrical Contractor shall coordinate Divisions 26, 27, and 28 work with the installer of Division 21, 22 and 23 and other work to ensure that code required clearances relating to space required for access to electrical equipment is properly maintained.
- C. Install Work using procedures defined in NECA Standard of Installation.
- D. Workmanship shall conform to highest industry standards for each trade involved in installation of the Work.
- E. Upon completion of work, all equipment and materials shall be installed complete, thoroughly checked, correctly adjusted, and left ready for intended use or operation. All work shall be thoroughly cleaned and all residues shall be removed from surfaces.
- F. Exterior surfaces of all material and equipment shall be delivered in a perfect, unblemished condition.
- G. Carefully lay out all work in advance so as to eliminate where possible, cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings and roofs. Any damage to the building, structure, piping, ducts, equipment or any defaced finish shall be repaired by skilled mechanics of the trades involved at no additional cost to the University.
- H. All openings made in fire-rated walls, floors, or ceilings shall be patched and made tight in a manner to conform to the fire rating for the surface penetrated. Paint to match surface when visible.
- I. All penetrations required through completed concrete construction shall be core drilled at minimum size required. Precautions shall be taken when drilling to prevent damage to structural concrete. The Contractor shall obtain permission from the Architect and Structural engineer before proceeding with drilling.
- J. Sleeve Seals: Provide sleeve seals for penetrations located in foundation walls below grade, or in exterior walls, of one of the following:
  - 1. Caulk between sleeve and raceway with approved Caulk material.
  - 2. Mechanical Sleeve Seals: Modular mechanical type, as manufactured by Thunder line Corp., consisting of interlocking synthetic rubber links shaped to continuously fill annular space between raceway and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal.
- K. Install equipment and materials to provide required Code clearances and access for servicing and maintenance. Coordinate the final location with piping, ducts, and equipment of other trades to insure proper access for all trades. Coordinate locations of concealed equipment, disconnects, and boxes with access panels and doors. Allow ample space for removal of parts, fuses, lamps, etc., that require replacement or servicing according to the National Electric code and the AHJ.
- L. Extend all conduits so that junction and pull boxes are in accessible locations.
- M. Install access panel or doors where equipment or boxes are concealed behind finished surfaces in areas such as restrooms. These access doors shall be a minimum of twenty by twenty inches or as required to accommodate full pull box or equipment access.
- N. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.

- O. Electrical system layouts indicated on drawings are generally diagrammatic but shall be followed as closely as actual construction and work of other trades will permit. Govern exact routing of raceways and locations of outlets by structure and equipment served. Take all dimensions from engineering drawings.
- P. Consult all other drawings. Verify all scales and report any dimensional discrepancies or other conflicts to Engineer before submitting bid.
- Q. All home runs to panel boards are indicated as starting from outlet nearest panel and continuing in general direction of that panel. Continue such circuits to panel as though routes were completely indicated.
- R. Furnish and install all necessary hardware, hangers, blocking, brackets, bracing, runners, etc. required for equipment specified under this Division.
- S. Remove all unused or abandoned conduit, junction boxes, panels, and other electrical components back to the source.
- T. Provide GFCI type receptacles for all "above counter" receptacles located within 6' of any sink or basin.
- U. Provide GFCI type receptacles for receptacles located with 6' of any eyewash station.
- V. Clean all luminaries, lamps and lenses prior to final acceptance. Replace all inoperative lamps.
- W. Provide all power feeds and final connections to motors and other electric equipment furnished under Divisions 21, 22, and 23.
  - 1. Install and wire through all control devices which directly handle full load motor or electric heating equipment current, such as magnetic starters, line voltage thermostats, P.E. switches, etc. which are furnished by Electrical Contractor. Located where shown on the electrical drawings.
  - 2. Provide disconnects for all mechanical equipment as indicated on project drawings.
  - 3. Provide all power and control wiring which directly handles full load current of motors or electric heating equipment.
- X. Electrical contractor shall include support of all existing non-supported electrical, communication, and miscellaneous wiring to meet current building codes with the limits of construction.
  - 1. This requirement shall apply to all existing electrical systems, low-voltage, data, telecom, communication, coax, video, signal, or similar that may be found within the limits of construction including above ceiling when project extend above ceiling.
  - 2. It is expected that all projects will include a reasonable but minor amount of resupport for the adjacent non-scope systems if necessary to pass code inspections for the in-scope project requirements.
  - 3. Areas that require extensive support of existing non-scope systems are not intended to be covered by this requirement unless identified in the project documents. If the contractor believes the amount of resupport to be extensive, they are to request a determination by the design and engineering team at the beginning of construction. If the design team determines that the amount of effort exceeds the requirements of this section, the design team will determine a percentage of the total resupport to be in excess of the requirements.

### 3.2 TESTING, CLEANING AND CERTIFICATION

- A. Operating and Acceptance Tests: Provide all labor, instruments, and equipment for the performance of tests as specified below and elsewhere in these specifications.
  - 1. Perform a careful inspection of the main switchboard bus structure and cable connections to verify that all connections are mechanically and electrically tight.
  - 2. For a one-day period after the remodeled area has been placed into normal service, record the full load current in each phase or each line at the panel bus and submit to the Engineer.

- B. Test Reports:
1. Test Reports: Submit three (3) copies of test results.
  2. The final University inspection of the project will not be made until a satisfactory report is received and approved by the University Project Manager.
  3. Results shall include:
    - a. Insulation resistance readings for each segment of high voltage (over 600V) cable, each phase.
    - b. Insulation resistance readings for transformers for each phase of primary and secondary to ground and for primary to secondary.
    - c. Insulation resistance readings on all feeders entering main distribution switchboard, each phase.
    - d. Resistance to ground readings for main distribution switchboard service ground.
    - e. Insulation resistance readings for all motors and motor feeders 5 horsepower or greater.
    - f. Full load current reading for main service entrance and main distribution panel board, each phase.
  4. Testing shall be done by an independent testing agency.
- C. Clean-Up: Remove all materials, scrap, etc., relative to the electrical installation, and leave the premises and all equipment, lamps, fixtures, etc. in a clean, orderly condition. Any costs to the University for clean up of the site will be charged against the Contractor.
- 3.3 COMMISSIONING (DEMONSTRATION)
- A. Acceptance Demonstration: Upon completion of the work, at a time to be designated, the Contractor shall demonstrate for the University the operation of the entire installation, including all systems provided under this contract.
- B. The Contractor shall furnish the services of a qualified representative of the supplier of each item or system who shall instruct specific personnel, as designated by the University, in the operation and maintenance of that item or system.
1. Instruction shall be given when the particular system is complete, and shall be of the number of hours indicated. A representative of the Contractor shall be present for all demonstrations.

#### PART 4 - CHANGE LOG

4/1/2021 1. Added requirement to support non-scope items to pass inspections.

**END OF SECTION 26 05 00**

## **SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

### **PART 1 - GENERAL**

#### **1.1 DESIGN REQUIREMENTS**

- A. Provide complete wire and cable system to meet the requirements of the project. Provide wire sizes in accordance with NEC.

#### **1.2 SUBMITTALS**

- A. Product data shall be submitted for in accordance with the requirements of Section 26 05 00 each of the following:
  - 1. Wires
  - 2. Cables
  - 3. Connectors

#### **1.3 QUALITY ASSURANCE**

- A. Wire and cable shall be provided and installed in accordance with the requirements of Section 26 05 00.
- B. Installer Qualifications and Certifications: Firms with at least 3 years of successful installation experience with projects utilizing electrical wiring cabling work similar to that required for this project.
- C. Regulatory Requirements: Conform to applicable code relations regarding toxicity of combustion products of insulating materials
- D. Manufacturers: Firms regularly engaged in manufacture of electrical wire and cable products of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than 5 years.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Wire and cable shall be delivered, stored and handled in accordance with the requirements of Section 26 05 00.
- B. Deliver wire and cable properly packaged in factory-fabricated type containers, or wound on NEMA-specified type wire and cable reels.
- C. Store wire and cable in clean dry space in original containers. Protect products from weather, damaging fumes, construction debris and traffic.
- D. Handle wire and cable carefully to avoid abrading, puncturing and tearing wire and cable insulation and sheathing. Ensure that dielectric resistance integrity of wires/cables is maintained.

#### **1.5 WARRANTY**

- A. Wire and cable warranties shall be provided in accordance with the requirements of Section 26 05 00.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**



- A. Acceptable Manufacturers: Subject to compliance with requirements, provide products by the following (for each type of wire, cable, and connector):
1. Wire and cable:
    - a. Southwire
    - b. West Penn
    - c. Windy City
  2. Connectors:
    - a. O-Z/Gedney Co.
    - b. AMP, Inc.
    - c. Burndy Corporation
    - d. Ideal Industries, Inc.
    - e. 3M Company
    - f. Thomas and Betts Corp.

## 2.2 MATERIALS, GENERAL

- A. Wires and Cables:
1. Provide new wire and cable suitable for the temperature, conditions, and location where installed. All cable shall be new and shall conform to or exceed IPCEA requirements. Building wire shall be insulated with THHN/THWN/THW or XHHW insulation, rated 600 volt.
  2. Conductors: Provide solid conductors for power and lighting circuits 12 AWG and smaller. Provide stranded conductors for 10 AWG THHN/THWN and larger. In sizes 250 MCM and larger use type THW or THWN. 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:
    - a. Where conduit temperature will exceed 100 degree F, use type THHN (90 degree C). Type XHHW (90 degree C) permissible in dry locations.
    - b. In 120-volt incandescent fixtures, type AF (150 degree C).
    - c. In wire ways of fluorescent lighting fixtures types THW-MTW, THHN (90 degree C).
  3. Conductor Material: Provide copper for all wires and cables.
  4. Metal Clad cable is acceptable.
  5. Use colors of wires as specified in paragraph 3.5 of this section.
  6. For general applications, other than special use, use THHN insulated wire.
  7. Type NM, NMC, NMS cable are not acceptable for any application.
  8. Use copper wire only.
  9. No wire splices shall be allowed in the conduit or conduit fittings. All splices shall be done in an approved box.
  10. Grounding conductors shall be copper type THHN with green integrally-colored insulation, sized to meet NEC.
  11. Plenum rated cable when required by Plenum conditions.
- B. Connectors:
1. Provide UL type factory-fabricated, solder less metal connectors of sizes, ampacity ratings, materials, types and classes for applications and for services indicated. Use connectors with temperatures equal to or greater than those of the wires upon which used.
- C. Wire Connectors:
1. For wires size #8 AWG and smaller, 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. For wires size #6 AWG and larger, T & B or equivalent compression type with 3M #33 or #88 tape insulation.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that mechanical work likely to damage cable has been completed.

### 3.2 INSTALLATION, GENERAL

- A. Install electrical cables, wires and connectors in compliance with applicable requirements of NEC, NEMA, UL, and NECA's "Standard of Installation", and in accordance with recognized industry practices.
- B. Coordinate wire/cable installation work, including electrical raceway and equipment connection work, with other work. Pull no wire into any portion of conduit system until all construction work, which might damage the wire, has been completed.
- C. BAS Conductor installation: (see Section 23 09 13)
- D. Wires and Cables:
  - 1. On systems greater than 600V thoroughly swab raceway before installing wire. Pull conductors simultaneously where more than one is being installed in same raceway. Use pulling compound or lubricant on all cable installations. compound used shall not deteriorate conductor or insulation.
  - 2. Use pulling means including, fish tape, cable, rope and basket weave wire/cable grips which will not damage cables or raceway. Do not use rope hitches for pulling attachment to wire or cable. Do not exceed manufacturer's tension requirements.
  - 3. Keep conductor splices to minimum. Install all wire continuous from outlet to outlet or terminal to terminal. Splices in cables when required shall be made in hand holes, pull boxes, or junction boxes and shall be in strict accordance with cable manufacturer's recommendations utilizing solder less connectors NEMA/UL approved for the use. Splice only in accessible junction boxes. Use splices and tap connectors which are compatible with conductor material.
  - 4. Install splices and tapes, which possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.
  - 5. Tighten electrical connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values. Where manufacturer's torque requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standard 486 for copper.
  - 6. Support cables above accessible ceilings, do not rest on ceiling tiles. Use spring clips and hanger rods, bridle rings or 'J' hooks, independent from the ceiling suspension system to support cables from structure.
  - 7. Provide adequate length of conductors within electrical enclosures and form the conductors to terminal points with no excess. Bundle multiple conductors, with conductors larger than 10 AWG cables to individual circuits. Make terminations so there is no bare conductor at the terminal.
  - 8. Make up splices in outlet boxes with 8-inch minimum of correctly color-coded tails left in box. Splices in wires size #8 AWG and smaller shall be made with insulated spring type wire connectors, "Scotchlok" or equivalent. Splices in larger wire and cables shall be made with indent connectors NEMA/UL approved for the purpose.
  - 9. Use split bolt connectors for copper wire splices and taps, 6 AWG through 1 AWG. Tape un-insulated conductors and connectors with electrical tape to 150% of the insulation value of conductor. Rubber, friction and 3M-33 or 88 or better. Two (2) layers minimum each.
  - 10. Use copper compression connectors for copper wire splices and taps, 1/0 AWG and larger. Tape un-insulated conductors and connectors with electrical tape to 150% of the insulation value of the conductor. Rubber, friction and 3M-33 or 88.
  - 11. Make splices, taps and terminations to carry full ampacity of conductors without perceptible temperature rise.
  - 12. Thoroughly tape the ends of spare conductors in boxes and cabinets.
  - 13. Install exposed cable, parallel and perpendicular to surfaces, or exposed structural member, and follow surface contours, where possible.
  - 14. Make all ground, neutral and line connections to receptacle and wiring device terminals as recommended by manufacturer. Provide ground jumper from outlet box to individual ground terminal of devices.
  - 15. Parallel conductors shall be cut to the same length and be the same type of wire.

16. All splices in control panels, terminal junction boxes, low voltage control circuits and fire alarm conductors shall be on numbered terminal strip.
17. When routed in a wall, install all thermostat wire, fire alarm, computer cable, low voltage cable, and other communication cable in conduit.
18. All junction boxes shall be fully accessible.
19. All wiring shall be routed through an acceptable raceway regardless of voltage application, unless specified otherwise under other sections of these standards.

### 3.3 TESTING, CLEANING AND CERTIFICATION

- A. Refer to Section 26 05 00 for testing, cleaning, and certification requirements.
- B. Prior to energizing circuitry, check installed wires and cables with megaohm meter to determine insulation resistance levels to ensure requirements are fulfilled. Test shall be made on all feeders regardless of size and on all branch circuits with No. 4 AWG and larger conductors.
- C. Prior to energizing, test wires and cables for electrical continuity and for short-circuits.
- D. Subsequent to wire and cable hook-up, energize circuitry and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

### 3.4 COMMISSIONING (DEMONSTRATION)

### 3.5 SCHEDULES

- A. Color code secondary service, feeder, and branch circuit conductors as follows:

120/208 Volts	Phase	277/480 Volts
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray
Green	Ground	Green
Switch leg - Pink 3 & 4 way travelers - Purple		

- B. Conductors shall be solid color for entire length.
- C. EXCEPTION:
  1. Conductors 8 AWG and larger may be black and shall be with color-coded at each termination and in each box or enclosure. For a distance of 6 inches use half-lapped 3/4 inch plastic tape in the specified color. Do not cover cable identification markings. Adjust tape locations to prevent covering of markings.

**END OF SECTION 26 05 19**

## SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 DESIGN REQUIREMENTS

- A. Ground the electrical service system neutral at service entrance equipment to grounding electrode system: cold water service pipe, building steel, concrete encased electrode and supplementary grounding electrodes in compliance with NEC.
- B. Ground each separately derived system neutral to nearest metallic cold water pipe, 2" diameter or larger, building steel or the referenced ground bar as shown on drawings.
- C. Provide grounding for telecommunications systems in accordance with the requirements in Section 27 05 26 Ground and Bonding for Communications Systems. Minimum conductor size between ground bar 3/0.
- D. Interconnect all ground bars in the building.

### PART 2 - PRODUCTS (NOT APPLICABLE)

### PART 3 - EXECUTION

#### 3.1 INSTALLATION, GENERAL

- A. Provide a separate insulated equipment-grounding conductor in all feeders. Terminate each ground conductor to the bushing and ground lug.
- B. All grounding materials shall be copper with the exception of ground rod, which may be copper clad steel.
- C. Grounding and Bonding for Communications Systems. Provide code-sized ground cable bonding jumpers, installed with ground clamps, across all conduit expansion couplings and fittings.
- D. Provide a corrosion-resistant finish to field connections, buried metallic bonding products, and where factory applied protective coatings have been destroyed, where subject to corrosive action.
- E. All continuous runs of cable tray and all isolated sections of cable tray shall be grounded at intervals not to exceed 20 feet.
- F. Provide an equipment-grounding conductor in all nonmetallic and flexible conduits.
- G. Provide equipment-grounding conductor in all branch circuits. Route to switches, receptacles, equipment enclosures, equipment, and panels etc. and ground as required.
- H. Use mechanical grounding connectors for all grounding connections. Exothermic welded connections may be used underground or to building steel.
- I. Minimum ground resistance:

Table	
Equipment	Earth Ground Resistance to Equipment (Ohms)
Pad Mount Transformer	5

Secondary neutrals and other ground	10
Lightning protection grounds	5

- J. Provide a separate insulated equipment-grounding conductor in feeder and branch circuits. Terminate each end on a grounding lug, buss or bushing.
- K. Provide grounding bushings and bonding jumpers for all conduits terminating in reducing washers, concentric, eccentric or oversized knockouts at panel boards, cabinets, and gutters.
- L. Provide bonding wire in all flexible conduits.

**END OF SECTION 26 05 26**

## SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 DESIGN REQUIREMENTS

- A. Provide equipment supports rated for the supported loads.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS, GENERAL

- A. Conduit Hangers: Galvanized steel with special accessories for purpose and adequate to support load imposed.
- B. Coatings: Supports, support hardware, and fasteners shall be protected with zinc coating or with treatment of equivalent corrosion resistance-using NEMA/UL approved alternative treatment, finish, or inherent material characteristic. Products for use outdoors shall be hot-dip galvanized.
- C. Raceway Supports: Clevis hangers, riser clamps, conduit straps, threaded C-clamps with retainers, ceiling trapeze hangers, and wall brackets.
- D. Fasteners: Types, materials, and construction features as follows:
  - 1. Expansion Anchors: Carbon steel wedge or sleeve type.
  - 2. Toggle Bolts: All steel springhead type.
- E. Conduit Sealing Bushings: Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit, or tubing passing through concrete floors and walls. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.
- F. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for no armored electrical cables in riser conduits. Provide plugs with number and size of conductor gripping holes as required to suit individual risers. Construct body of malleable-iron casting with hot-dip galvanized finish.
- G. U-Channel Systems: 16-gauge steel channels, with 9/16-inch-diameter holes, at a minimum of 8 inches on center, in top surface. Provide fittings and accessories that mate and match with U-channel and are of the same manufacture.
- H. Supports: Provide supporting devices of types, sizes and materials indicated; and having the following construction features:
  - 1. One-Hole Conduit Straps or Minerallac: For supporting 3/4 inch and smaller conduit, galvanized steel.
  - 2. 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.
- I. Fabricated Supporting Devices:
  - 1. General: Shop- or field-fabricated supports or manufactured supports assembled from U-channel components.
  - 2. Steel Brackets: Fabricated of angles, channels, and other standard structural shapes. Connect with welds and machine bolts to form rigid supports.

3. Pipe Sleeves: Provide pipe sleeves of one of the following:
  - a. Sheet Metal: Fabricate from galvanized sheet metal; round tube closed with snap lock joint, welded spiral seams, or welded longitudinal joint.
  - b. Fabricate sleeves from the following gauge metal for sleeve diameter noted:
    - 1) 3-inch and Smaller: 20 gauge
    - 2) 4-inch to 6-inch: 16 gauge
    - 3) Over 6-inch: 15 gauge
  - c. Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe.
  - d. EMT, IMC, or Rigid Conduit.
- J. J-Hooks and Bridle Rings
  1. J-hooks and bridle rings may be used to support low voltage wiring systems in non-lab areas.
- K. The following are prohibited.
  1. Plastic or fiber anchors.
  2. Drilling or structured steel members.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

- A. Conduit Hangers: Support individual conduit 1-1/2 inch and larger and all multiple conduit runs with hangers. Clamp conduits individually to each support.
- B. Supports and Hangers:
  1. Support and align all raceways, cabinets, boxes, fixtures, etc., in an accepted manner and as herein specified. Support raceways on accepted types of wall brackets, specialty steel clips or hangers, ceiling trapeze hangers or malleable iron straps. Provide lead expansion shields in concrete, machine screws, bolts or welding on metal surfaces, and wood screws on wood construction. Use of powder-driven studs is prohibited without express permission from the University Project Manager.
    - a. Mount all conduits to structure a minimum of 7 inches above any accessible type ceiling, or with spacing as required to permit relocation of recessed fixtures to any location.
  2. Structural and post tensioned concrete members shall not be drilled or pierced without prior approval from the University Project Manager.
  3. Where outlets are installed in steel stud type systems, provide additional cross bracing, bridging and/or straps as required to make outlet completely rigid prior to application of wall facing material.
  4. Design hangers and wall brackets so that maximum deflection will be no greater than 1/8 inch.
  5. Install supporting devices to fasten electrical components securely and permanently in accordance with NEC requirements.
  6. Coordinate with the building structural system and with other electrical installation.
- C. Raceway Supports: Comply with the NEC and the following requirements:
  1. Conform to manufacturer's recommendations for selection and installation of supports.
  2. Strength of each support shall be adequate to carry present and future load multiplied by a safety factor of at least four. Where this determination results in a safety allowance of less than 200 pounds, provide additional strength until there is a minimum of 200 pounds safety allowance in the strength of each support.
  3. Install individual and multiple (trapeze) raceway hangers and riser clamps as necessary to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.
  4. Use of ceiling support wires is unacceptable.
  5. Support parallel runs of horizontal raceways together on trapeze-type hangers. Use 3/8-inch diameter or larger threaded steel rods for support. Threaded rod shall be covered by 1/2 inch conduit from bottom of (trapeze) support to 6-inches above cable tray.

6. Support individual horizontal raceways by separate pipe hangers.
  7. Space supports for raceways in accordance with NEC.
  8. In all runs, arrange support so the load produced by the weight of the raceway and the enclosed conductors is carried entirely by the conduit supports with no weight load on raceway terminals.
  9. Threaded rod supports to have bottoms cut off at a maximum length equal to rod diameter below bottom double nut. Remove sharp edges.
- D. Miscellaneous Supports: Support miscellaneous electrical components separately and as required to produce the same structural safety factors as specified for raceway supports. Install metal channel racks for mounting cabinets, panel boards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices.
- E. In open overhead spaces, support metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on opposite sides of the box and support the raceway with an engineer approved type of fastener not more than 24 inches from the box.
- F. Sleeves: Install in walls and all other fire-rated floors and walls for raceways and cable installations as required. Where sleeves through floors are installed, extend above finish floor. For sleeves through fire rated-wall or floor construction, apply UL listed fire stopping sealant in gaps between sleeves and enclosed conduits and cables. See Engineering plans for location and extent of fire rated assemblies.
- G. Fastening: Unless otherwise indicated, fasten electrical items and their supporting hardware securely to the building structure, including but not limited to conduits, raceways, cables, cable trays, bus ways, cabinets, panel boards, transformers, boxes, disconnect switches, and control components in accordance with the following:
1. Fasten by means of wood screws or screw-type nails on wood, toggle bolts on hollow masonry units, concrete inserts or expansion bolts on concrete or solid masonry, and machine screws, welded threaded studs, or spring-tension clamps on steel. Powder-driven studs are not acceptable. Do not weld conduit, pipe straps, or items other than threaded studs to steel structures. In partitions of light steel construction, use sheet metal screws.
  2. Holes cut to depth of more than 1-1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete shall not cut the main reinforcing bars. Fill holes that are not used.
  3. Ensure that the load applied to any fastener does not exceed 25% of the proof test load. Use vibration- and shock-resistant fasteners for attachments to concrete slabs.
- H. Telecommunications Systems Cable Supports: Use cable tray or telecommunications approved cable supports.

**END OF SECTION 26 05 29**



## SECTION 26 05 33 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

### PART 1 - GENERAL

#### 1.1 SYSTEM DESIGN REQUIREMENTS

- A. Provide complete raceway system required to meet project requirements in sizes as required by NEC.
- B. Utilize boxes as part of the electrical raceway system. Size boxes in accordance with NEC requirements and this standard.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Conduit: Allied
    - a. Republic
    - b. Carlon
  - 2. Fittings and Bodies:
    - a. O/Z Gedney
    - b. Regal was purchased by Bridgeport
    - c. Bridgeport
    - d. Raco
    - e. Appleton
  - 3. Conduit Seals:
    - a. Chase-Foam CTC PR-855, or approved equal
  - 4. Wire ways:
    - a. Hinged cover or screw cover complete with all necessary fittings which shall be of one manufacturer.

#### 2.2 MATERIALS, GENERAL

- A. Metal Conduit and Tubing:
  - 1. Galvanized Steel Rigid Conduit (GRC):
    - a. Conduit: Provide rigid steel conduit, hot-dipped galvanized with threaded ends Fittings: Threaded galvanized steel, bushings shall have nylon-insulated throat.
  - 2. Electrical Metallic Tubing (EMT):
    - a. Conduit: Galvanized steel tubing, galvanized on the outside and coated on the inside with a hard smooth lacquer finish. Fittings: Steel compression fittings for rain-tight and concrete-tight applications. Steel set-screw for interior connections. Set-screw quick fit type for 2-1/2 inch and larger may be used. Bushings shall be threaded and have nylon insulated throat or nylon bushing.
  - 3. Intermediate metal conduit (IMC)
    - a. Conduit: Provide intermediate steel conduit hot-dipped galvanized Fittings: Threaded galvanized steel, bushings shall have nylon-insulated throat.
  - 4. Rigid Aluminum Conduit:
    - a. Not allowed unless otherwise noted.
  - 5. Flexible Metal Conduit:
    - a. Conduit: Continuous spiral wound, interlocked, zinc-coated steel, NEMA/UL approved for grounding.
    - b. Fittings: Cadmium plated, malleable iron. Straight connector shall be one-piece body, female end with clamp and deep slotted machine screw for securing conduit, and threaded male end provided with a locknut. Angle connectors shall be two-piece body with

removable upper section, female end with clamp and deep slotted machine screw for securing conduit, and threaded male end provided with a locknut. All fittings 1 inch and larger shall be terminated with threaded bushings having nylon insulated throats.

- c. Maximum length of 6 feet.
  - d. Minimum size of 1/2 inch.
  - 6. Liquid-Tight Flexible Metal Conduit:
    - a. Conduit: Continuous spiral wound, interlocked zinc-coated steel with polyvinyl chloride (PVC) jacket, NEMA/UL approved for grounding.
    - b. Fittings: Cadmium plated malleable iron. Straight and angle connectors shall be the same as used with flexible metal conduit but shall be provided with a compression type steel ferrule and neoprene gasket sealing rings.
  - 7. Non-metallic Rigid Conduit
    - a. PVC plastic schedule 40
  - B. Conduit Bodies:
    - 1. General: Types, shapes and sizes, as required to suit individual applications and National Electric Code (NEC) requirements. Provide matching gasket covers secured with corrosion-resistant screws.
    - 2. Metallic Conduit and Tubing: Use metal conduit bodies. Use bodies with threaded hubs for threaded raceways and in hazardous locations.
    - 3. Telephone EL's are not acceptable.
- 2.3 MATERIALS, GENERAL
- A. Sheet Steel: Flat rolled, code-gage, galvanized steel.
  - B. Fasteners for General Use: Corrosion resistant screws and hardware including cadmium and zinc plated items.
  - C. Fasteners for damp or wet locations: Stainless steel screws and hardware.
  - D. Exterior Finish: Gray baked enamel for items exposed in finished locations except as otherwise indicated.
  - E. Metal outlet, device, and small wiring boxes:
    - 1. General: Boxes shall be of type, shape, size, and depth to suit each location and application.
    - 2. Steel Boxes: Boxes shall be sheet steel with stamped knockouts, threaded screw holes and accessories suitable for each location including mounting brackets and straps, cable clamps, exterior rings and fixture studs.
  - F. Outlet Boxes, Pull and Junction Boxes (J-Boxes):
    - 1. General: Boxes shall have screwed or bolted-on covers of material same as box and shall be of size and shape to suit application.
    - 2. Steel Boxes: Sheet steel with welded seams. Where necessary to provide a rigid assembly, construct with internal structural steel bracing.
    - 3. Hot dipped galvanized steel boxes: Sheet steel with welded seams. Where necessary to provide a rigid assembly, construct with internal structural steel bracing. Hot-dip galvanized after fabrication. Cover shall be gasketed.
    - 4. Outlet Boxes: Hot-dipped galvanized of required size, 4 inch square, 2" depth minimum or octagonal and of depth required for flush mounted devices and lighting fixtures. Cast-type with gasketed covers for surface-mounted devices. All outlets for exterior application shall be cast, weatherproof type with gasket and cast cover plate.
    - 5. Junction and Pull Boxes: Use outlet boxes as J-boxes wherever possible. Larger J-boxes pull boxes shall be accessible and shall be fabricated from sheet steel, sized according to code.
  - G. Non metallic boxes are not permitted.

## PART 3 - EXECUTION

### 3.1 INSTALLATION, GENERAL

#### A. Conduit Sizes:

1. The conduit shall be sized in accordance with NEC.
  - a. For power and lighting circuits, the minimum conduit size shall be 3/4"
  - b. Flexible and Liquid-tight Flexible Conduit: 1/2 inch for all runs. Maximum 6-foot length.
  - c. Conduits used for home runs shall contain only the conductors for the circuits indicated on the drawings. Combining unrelated multiple home runs into a single conduit would not be permitted.

#### B. Type of Conduit Used

1. Rigid Galvanized conduit or intermediate metallic steel conduit shall be installed in the following areas.
  - a. All outdoor non-conditioned locations concealed and exposed.
  - b. Interior exposed. Below 10 feet to floor. PVC coated 90 degree elbows underground when penetrating floor slabs.
2. Electrical Metallic Tubing (EMT):
  - a. Interior concealed spaces.
  - b. Interior exposed above 10 feet to floor.
  - c. Not permitted underground, in concrete, and in hazardous or corrosive areas.
3. Sealtite metal conduit shall be provided for: Makeup of motor, transformer or equipment, and/or raceway connections where isolation of sound and vibration transmission is required. For connections in locations exposed to weather, or in interior locations subject to moisture, watertight flexible conduit shall be used.
4. Non-metallic Rigid Conduit:
  - a. In concrete and underground.
  - b. Not permitted for interior use.

#### C. General: Install electrical raceway in accordance with manufacturer's written installation instructions, applicable requirements of NEC, and as follows:

1. Conceal all conduits unless indicated otherwise, within finished walls, ceilings, and floors. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot water pipes.
2. Elevation of Raceway: Where possible, install horizontal raceway runs above water and steam piping, keep close to structure.
3. Complete installation of electrical raceways before starting installation of conductors within raceways.
4. Provide supports for raceways as required per NEC. Prevent foreign matter from entering raceways by using temporary closure protection.
5. Make bends and offsets so the inside diameter is not effectively reduced. Unless otherwise indicated, keep the legs of a bend in the same plane and the straight legs of offsets parallel. All bends shall be made in an approved bending machine or factory-made. Hickey bends will not be permitted in conduits larger than 3/4 inch. Refer to Section 27 05 28 for special bending requirements for Telecommunications Systems.
6. Use raceway fittings that are of types compatible with the associated raceway and suitable for the use and location. Install expansion fittings across all structural construction joints and expansion/deflection couplings across all structural expansion joints and in every 200 feet of linear conduit run. A flexible bonding jumper at least three times the nominal width of the joint shall be installed.
7. Run concealed raceways parallel and perpendicular to building elements at right angles.
8. Install exposed raceways parallel and perpendicular to nearby surfaces or structural members and follow the surface contours as much as practical. Paint all exposed raceways to match surrounding area.

9. Run exposed and parallel raceways together. Make bends in parallel runs from the same centerline so that the bends are parallel. Factory elbows may be used only where they can be installed parallel. In other cases, provide field bends for parallel raceways.
10. Make raceway joints tight. Where joints cannot be made tight, use bonding jumpers to provide electrical continuity of the raceway system. Make raceway terminations tight. Where terminations are subject to vibration, use bonding bushings or wedges to assure electrical continuity. Where subject to vibration or dampness, use insulating bushings to protect conductors. Joints in non-metallic conduits shall be made with solvent cement in strict accordance with manufacturer's recommendations.
11. Terminations: Where raceways are terminated with locknuts and bushings, align the raceway to enter squarely and install the locknuts with dished part against the box. RGC shall be secured with double locknuts and an insulated metallic bushing. EMT shall be secured with one locknut and shall have nylon-insulated throats or threaded nylon bushings from 1/2 inch to 1 inch. 1-1/4 inch and above shall be metal with nylon insulated throats. Use grounding type bushings for feeder conduits at switchboards, panel boards, pull boxes, transformers, motor control centers, VFDs, etc.
12. Where terminating in threaded hubs, screw the raceway or fitting tight into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align the raceway so the coupling is square to the box, and tighten the chase nipple so no threads are exposed.
13. Install pull wires in empty raceways. Use #14 AWG zinc-coated steel or monofilament plastic line having not less than 200-pound tensile strength. Leave not less than 12 inches of slack at each end.
14. Telecommunications and Signal Systems Raceways: Refer to Section 27 05 28 Pathways for Communications.
15. Install raceway-sealing fittings in accordance with the manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL Listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway-sealing fittings at the following points and elsewhere as indicated:
  - a. Where conduits enter or leave hazardous locations.
  - b. Where conduits pass from warm locations to cold locations, such as the boundaries of refrigerated spaces and air-conditioned spaces.
  - c. Where required by the NEC.
16. Flexible Connections: Use short length (maximum of 6 feet) of flexible conduit for recessed and semi-recessed lighting fixtures, for equipment subject to vibration, noise transmission, or movement; and for all motors. Use liquid tight flexible conduit in wet locations. Install separate ground conductor in all flexible connections.
17. Conduit Seals: Conduit passing through concrete walls shall be sealed.
18. Where conduits are to be installed through structural framing members, the contractor shall provide sleeves. Cut all openings in concrete with rotary type drill, or other method as approved by the University Project Manager. Holes cut with pneumatic hammer will not be accepted. For areas where sleeves have not been provided, the Engineer's written approval must be obtained prior to cutting, notching or drilling of structural framing members.
19. Ream the ends of all cut and/or threaded conduit. Ends shall be cut square.
20. Use of running threads for rigid metallic conduit are not permitted. When threaded couplings cannot be used, provide 3-piece union or solid coupling.
21. Conduits shall not cross pipe shafts or ventilation duct openings "access panel".
22. Conduit shall not obstruct full and direct access to equipment requiring maintenance. This includes but is not limited to valves, actuators and terminal box controllers.
23. Install an insulated ground conductor in all conduits.
24. Where individual conduits penetrate fire-rated walls and floors, provide pipe sleeve one size larger than conduit; pack void around conduit with fire rated insulation and seal opening around conduit with UL Listed foam silicone elastomer compound. Conduits on trapeze type support system shall require fire taping only.
25. Where conduit sleeves penetrate fire rated floors or walls for installation of system cables, AC or MC cables, or modular wiring cables, pack void around cables or empty sleeve with fire rated insulation and fill ends with fire-resistive compound. Seal opening around sleeve with UL Listed foam silicone elastomer compound.

26. Provide separate raceway systems for each of the following:
  - a. Lighting
  - b. Power Distribution
  - c. Emergency (Essential)
    - 1) Lighting
    - 2) Power distribution
  - d. Low voltage systems, including telephone and communications, EQ alarm, security, fire alarm.
  - e. Audio/Visual
27. Provide for waterproofing of all raceways, fittings, etc., which penetrate the roof to preserve the weatherproof integrity of the building. Installation of materials shall conform to the following:
  - a. General:
    - 1) Install all raceways concealed except at surface cabinets, for motor and equipment connections and in mechanical equipment rooms. Install a minimum of 6 inch from flues, steam pipes or other heated pockets for water-flashing and counter-flashing or pitch pockets for waterproofing of all raceways, outlets, fittings, etc., which penetrate roof. Route exposed raceways parallel or perpendicular to building lines with right angle turns and symmetrical bends. Concealed raceways shall be run in a direct line, and where possible, with long sweep bends and offsets.
    - 2) Provide raceway expansion joints with necessary bonding conductor at building expansion joints and where required to compensate for raceway or building thermal expansion and contraction. Terminate raceways 1-1/4 inch and larger with insulated bushing or rain tight connections with insulated throats.
28. Special areas methods for raceway installation (with appropriate seal-offs, explosion-proof fittings, etc.), in all special occupancy areas, as defined and classified in Article 500 of the National Electric Code (NEC), shall be in accordance with that Article.
29. If type MC or AC cable is used for branch circuits, the home run conduit will be EMT and must run from the panel to within 10 feet horizontally of the first device served.
30. All underground raceways, not under the building footprint, shall be installed so it slopes away from the building.

D. Raceway Installation:

1. Surface raceways, where indicated on drawings, shall be metal and of a size approved for number and size of wires to be installed, shall be installed in a neat, workmanlike manner, with runs parallel or perpendicular to walls and partitions. Raceways, elbows, fittings, outlets and devices shall be of same manufacturer, and designed for use together.
2. Wire ways, where indicated, complete with elbows, tees, connectors, adaptors, etc., with all parts factory-fabricated and of same manufacture.

### 3.2 INSTALLATION, GENERAL

A. Boxes:

1. Every J-box shall be secured, independent of conduit entries into the box. Boxes shall be secured to the building structure. Ceiling wire shall not be used to support (secure) J-boxes.
2. Box fill shall be governed by code requirements. Only the allowable amount of conduit entries shall be allowed into the box.
3. Box covers shall be marked so as to indicate the voltage, panel number, and circuit number of the enclosed conductors.
4. Each J-box shall have only one voltage installed.
5. Cap unused knockout holes where blanks have been removed and plug unused conduit hubs.
6. Sizes shall be adequate to meet NEC volume requirements, but in no case smaller than sizes indicated.
7. Remove sharp edges where they may come in contact with wiring or personnel.
8. All conduits connected to a flush panel shall be concealed.

B. Outlet Boxes:

1. Exact location of outlets and equipment shall be governed by structural conditions and obstructions or other equipment items. When necessary, relocate outlets so that when fixtures or equipment are installed, they will be symmetrically located according to room layout and will not interfere with other work or equipment. Verify final location of all outlets, panels, equipment, etc. with the University Project Manager.
2. Switch Outlet and Panel board height dimensions to meet ADA requirements.
3. Above counters, benches, special equipment, baseboards, fin tube radiators, etc., or at wainscoting, outlets shall be mounted minimum 6 inches above to prevent interferences to service equipment, or as noted on drawings.
4. Fire rated poke-through shall be installed in areas to miss beams and ductwork in ceiling below. Floors shall be X-rayed before core drilling.
5. Outlets at windows and doors: Locate close to window trim in an accessible location. For outlets indicated above doors center outlets above the door opening except as otherwise indicated.
6. Column and pilaster locations: Locate outlet boxes for switches and receptacles on columns or pilasters so the centers of the columns are clear for future installation of partitions. Locate in an accessible location.
7. Locations in special finish materials: For outlet boxes for receptacles and switches mounted in desks or furniture cabinets or in glazed tile, concrete block marble, brick, stone or wood walls, use rectangular shaped boxes with square corners and straight sides. Install such boxes without plaster rings. Saw cut all recesses for outlet boxes in exposed masonry walls.
8. Mounting: Mount outlet boxes for switches and receptacles with the long axis vertical or as indicated. Three or more gang boxes shall be mounted with the long axis horizontal. Locate box covers or device plates so they will not span different types of building finishes either vertically or horizontally. Locate boxes for switches near doors on the strike side, close to door trim. Provide far side box supports for electrical boxes installed on metal studs.
9. Ceiling outlets: For fixtures, where wiring is concealed, use outlet boxes 4-inches square by 1-1/2 inches deep, minimum.
10. Protect outlet boxes to prevent entrance of plaster, and/or debris. Thoroughly clean foreign material from boxes before conductors are installed.
11. Concrete boxes: Use extra deep boxes to permit side conduit entrance without interfering with reinforcing, but do not use such boxes with over 6-inch depth.
12. Existing outlet boxes: Where extension rings are required to be installed, drill new mounting holes on the existing boxes where existing holes are not aligned.
13. Back to back outlet boxes are not permitted. Separate boxes a minimum of 6 inches in standard walls and 24 inches in acoustical walls.

C. Installation of Pull and J-Boxes:

1. Box selection: For boxes in main feeder conduit runs, use minimum 8-inches square by 4-inches deep or as needed per NEC. Do not exceed 6 entering and 6 leaving raceways in a single box.
2. Cable supports: Install clamps, grids, or devices to which cables may be secured. Arrange cables so they may be readily identified. Support cable at least every 30 inches inside boxes.
3. Mount pull boxes in inaccessible ceilings with the covers flush with the finished ceiling.
4. Every J-box shall be secured, independent of conduit entries into the box. Boxes shall be secured to the building structure. Provide rigid supports for all J-boxes, ceiling wire supports are not acceptable.
5. Box fill shall be governed by code requirements. Only the allowable amount of conduit entries shall be allowed into the box.
6. Box covers shall be marked so as to indicate the voltage, panel numbers, and circuit number of the enclosed conductors. Use pre-printed labels, marking cover with permanent marker is not acceptable.

D. Grounding:

1. Electrically ground metallic cabinets, boxes, and enclosures. Where wiring to item includes a grounding conductor, provide a grounding terminal in the interior of the cabinet, box or enclosure.

E. Outlets:

1. Provide zinc-coated or cadmium-plated sheet steel outlet boxes not less than 4 inch octagonal or square, unless otherwise noted. Equip fixture outlet boxes with 3/8-inch no-bolt fixture studs. Where fixtures are mounted on or in an accessible type ceiling, provide a J-box and extend flexible conduit, maximum 6' to each fixture. Outlet boxes in finished ceilings or walls shall be fitted with appropriate covers, set to come flush with the finished surface. Where more than one switch or device is located at one point, use gang boxes and covers unless otherwise indicated. Sectional switch boxes or utility boxes will not be permitted. Provide tile box or a 4-inch square box with tile ring where "drywall" type materials are applied.
- F. Pull and J-Boxes and Cabinets:
1. Construct J-boxes or pull boxes not over 150 cubic inches in size as standard outlet boxes, and those over 150 cubic inches the same as "Cabinets," with hinged covers of same gauge metal. Removable covers must be accessible at all times.
  2. Provide a standard 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. Coordinate location and type with the University Project Manager. Access panels shall be minimum 24"x24" or 6" larger than pull box.
  3. All cabinets shall be set rigidly in place with fronts straight and plumb, center panel board interiors in door openings.

**END OF SECTION 26 05 33**

## **SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS**

### **PART 1 - GENERAL**

#### **1.1 DESIGN REQUIREMENTS**

- A. All electrical equipment and systems shall be properly labeled in accordance with this section. It includes requirements for electrical identification components including but not limited to the following:
  - 1. Identification labeling for raceways, cables, and conductors.
  - 2. Equipment labels and signs.

#### **1.2 SUBMITTALS**

- 1. Samples of each color, lettering style, and other graphic representation required for identification materials; samples of labels and signs.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Acceptable Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Ideal Industries, Inc.
  - 2. LEM Products, Inc.
  - 3. Markal Corp.
  - 4. Panduit Corp.
  - 5. W.H. Brady, Co.

#### **2.2 MATERIALS, GENERAL**

- A. Nameplates: Engraved plastic laminate, black letters on white background for normal systems and white letters on red background for emergency systems.
- B. Electronic Labels: 9mm self-adhesive tape, black letters on clear for normal systems and red letters on clear for emergency systems. Embossed DymoType labels are not accepted.
- C. Wires and Cable Markers: Cloth markers, split sleeve and tubing type.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLATION, GENERAL**

- A. Lettering and Graphics: Coordinate names, abbreviations, colors, and other designations used in electrical identification work with corresponding designations specified or indicated. Install numbers, lettering, and colors as approved in submittals and as required by code.
- B. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work. Degrease and clean surfaces to receive nameplates and labels.
- C. Conduit Identification: Use adhesive marking labels at 40 foot intervals to identify all conduits run exposed or located above accessible ceilings. Conduits located above non-accessible ceiling or in floors and walls shall be labeled within 3 feet of becoming accessible. Use the following colors:
  - 1. 600 Volt and Below: Black letters on orange background indicating feeder identification and
  - 2. Other Systems: Provide color banding as specified below.



- D. Identify System Raceways with Color Banding: Band exposed or accessible raceways of the following systems for identification. Bands shall be pre-tensioned, snap-around colored plastic sleeves, colored adhesive marking tape, or a combination of the two. Make each color band 2 inches wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side. Install bands at changes in direction, at penetrations of walls and floors, and at 40-foot maximum intervals in straight runs. Provide Brady B-946 vinyl or equivalent. Colored duct tape is not acceptable. Apply the following colors:
1. Security System: Blue and Yellow with Gray Cable.
  2. Telecommunications System: Green and Yellow with Blue and White Cables.
  3. Fire Alarm Systems: Red with Red Cable.
  4. Audio/Visual Systems: Violet.
  5. Building Automation System (BAS): Blue and Green.
  6. Lighting Control Cabling shall be Green.
- E. Identify Junction, Pull, and Connection Boxes: Identification of systems and circuits shall be pressure-sensitive, self-adhesive label indicating system voltage and identity of contained circuits on outside of box cover. Color code shall be same as conduits for pressure sensitive labels. Use pressure-sensitive plastic labels at exposed locations and indelible marker (black or red) at concealed boxes. All fire alarm boxes shall have covers painted red.
- F. Power Circuit Identification: Tag or label conductors as follows:
1. Multiple Circuits: Where multiple branch circuits or control wiring or communications/signal conductors are present in the same box or enclosure label each conductor or cable including neutrals. Provide legend indicating source, voltage, circuit number, and phase for branch circuit wiring. Phase and voltage of branch circuit wiring may be indicated by means of coded color of conductor insulation. For control and communications/signal wiring, use color coding or wire/cable marking tape at terminations and at intermediate locations where conductors appear in wiring boxes, troughs, and control cabinets. Use consistent letter/number conductor designations throughout on wire/cable marking tapes.
  2. Match identification markings with designations used in panel boards shop drawings, Contract Documents, and similar previously established identification schemes for the facility's electrical installations.
- G. Install equipment/system circuit/device identification as follows:
1. Apply equipment identification labels of engraved plastic-laminate on each major unit of electrical equipment in building, including central or master unit of each electrical system. This includes communication/signal/alarm systems, unless the unit is specified with its own self-explanatory identification. Text shall match terminology and numbering of the Contract Documents and shop drawings. Identification must include equipment name, voltage, phase, amperage, and fed from.. Apply labels for each unit of the following categories of electrical equipment.
    - a. Switchboards, switchgear, panelboards and enclosures, 1/2" high lettering.
    - b. Access doors and panels for concealed electrical items, 1/4" letters
    - c. Transformers 1/2" high letters.
- H. Apply circuit/control/item designation labels of engraved plastic laminate for disconnect switches, breakers, pushbuttons, pilot lights, motor control centers, and similar items for power distribution and control components above, except panel boards and alarm/signal components, where labeling is specified elsewhere.
- I. For panel boards, provide framed, typed circuit schedules (label all spares and spaces in pencil) with explicit description and identification of items controlled by each individual breaker.
- J. Install labels at locations indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.

- K. Provide tape labels for identification of individual receptacle and switch wall plates. Locate tape on front of plate and identify branch circuit serving the receptacle or switch.

**END OF SECTION 26 05 53**

## **SECTION 28 05 00**

### **COMMON WORK RESULTS FOR ELECTRONIC LIFE SAFETY**

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

##### **1.1 SECTION INCLUDES**

- A. Cable Material Requirements.
- B. Cable Installation Requirements.

##### **1.2 GENERAL REQUIREMENTS**

- A. The requirements of the Contract Documents, including the General and Supplementary General Conditions, and Division 1 – General Requirements shall apply to work of this Section.
- B. At the time of bid, all exceptions taken to these Specifications, any variances to the contract drawing design, and any non-conformance to the operating capabilities called for in this specification, shall be listed in writing and forwarded with the submission of the bid. Any such exception, variance, or non-conformance, which was not listed at the time of bid, and is identified in the submittal, shall be grounds for immediate disapproval without comment.

##### **1.3 RELATED SECTIONS**

- A. Division 07: Firestopping.
- B. Division 26: Common Work Results for Electrical Systems.
- C. Division 26: Low Voltage Electrical Power Conductors and Cables.
- D. Division 26: Grounding and Bonding for Electrical Systems.
- E. Division 26: Hangers and Supports for Electrical Systems.
- F. Division 26: Raceways and Boxes for Electrical Systems.
- G. Division 26: Identification for Electrical Systems.
- H. Division 28: Fire Detection and Alarm.
- I. Division 28: Fire Alarm Voice Evacuation.
- J. Technical Guidelines

##### **1.4 SUBMITTALS**

- A. Reference Division 01 – Submittal Procedures
  - 1. Product Data: Provide manufacturer's data sheets showing product appearance, electrical characteristics, and connection requirements.

2. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use, as stipulated by the product-testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and start-up of products.
3. Exceptions: Provide a detail listing of any and all exceptions, variances, and non-conformances to the specifications and contract design drawings. Failure to disclose any such items shall be grounds for immediate disapproval of submittals without comment.
4. Samples: Provide samples of the following items.
  - a. Provide a minimum of two (2) samples of all cable to be installed on the projects. Cable samples shall be of sufficient length to identify cable marking (striping) and cable listing identification.
  - b. Provide a minimum of two (2) samples of all cable supporting devices, metal bridle rings, metal mounting brackets, plastic plenum rated wire bushings, and other applicable cable installation equipment to be utilized on the project.

## 1.5 QUALIFICATIONS

- A. Installer/Vendor: Owner approved installers/vendors only.
- B. Manufacturer: Company specializing in manufacturing the products specified in this section with a minimum three (3) years' experience, and with service facilities within fifty (50) miles of the project.
- C. Fire Alarm Installer: Installing Company shall use only an Owner Approved EST dealer for programming and final testing. The Bidding Company must specialize in installing the products specified in this section with a minimum three (3) years documented experience. The installer shall employ NICET Level 2 trained technicians to install the products specified in this Section.

## PART 2 - PRODUCTS

### 2.1 FIRE ALARM SYSTEM WIRE AND CABLE

- A. Cable for Class 1 Remote Control and Signal Circuits: Copper conductor, 600 volts insulation rated 75 degrees C, individual conductors twisted together, shielded, and covered with a non-metallic jacket, UL listed for use in air handling ducts, hollow spaces used as ducts, and plenums.
- B. Cable for Class 2 or Class 3 Remote Control and Signal Circuits: Copper conductor, 300 volts insulation rated 75 degrees C, individual conductors twisted together, shielded, and covered with a non-metallic jacket, UL listed for use in air handling ducts, hollow spaces used as ducts, and plenums.
- C. Provide wet environment exterior rated cable for underground raceway or exterior cable applications. THHN will not be accepted.
- D. Install all remote control and signal cables in raceways or supported every 4 to 6 feet on metal bridle rings.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Cable shall be installed in conduit throughout.

- C. Do not exceed 40% fill rate in raceways and back boxes.
  - 1. For retrofit applications, conduit and box fill shall be assessed and approved by the Engineer and Owner.
- D. Minimum size for back boxes shall be 4" x 4" x 2-1/8" with 512 HD mounting bracket or approved equivalent.
- E. Adjustable Caddys are not permitted.
- F. The use of extension rings on new or retrofit construction shall be approved on a "case-by-case basis" by the Engineer and Owner.
- G. Junction boxes for any new or retrofit construction, that have more than four (4) wire splice connections, shall utilize WAGO connectors (<http://www.wago.us/products/2631.htm>) , or equivalent as approved by Owner project manager.
- H. Wire runs shall be continuous and shall not contain splices or t-taps unless otherwise approved by Engineer and Owner.
- I. Wiremold will not be accepted.
- J. Electrical junction boxes shall be covered with a red cover plate.
- K. Electrical back boxes shall utilize knockouts only as necessary. Unused knockout holes are not permitted.
- L. All box knock outs and exposed conduit edges shall have plastic edge protection.
  - 1. Conduit shall be provided in exposed joist construction and above hardlid ceilings.
  - 2. Conduit shall be provided for all lab areas.
  - 3. Conduit shall be provided for all areas where wire would be exposed or unprotected.
  - 4. Conduit shall be in accordance with The National Electrical Code (NEC), local and state requirements.
  - 5. Conduit is not permitted to be secured to the roof deck. All existing conduit utilized for fire alarm shall be removed if improperly secured to the roof deck and new conduit shall be installed. Conduit shall be installed in accordance with NEC spacing requirements from the roof deck.
  - 6. All conduit shall be installed by a licensed electrician.
  - 7. All conduit shall be red, hot-galvanized, fire alarm EMT. Conduit shall be painted to match existing surface if requested by owner.
  - 8. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per NEC.
  - 9. Conduit shall not enter the fire alarm control panel, or any other remotely mounted control panel equipment or back boxes, except where conduit entry is specified by the FACP manufacturer.
  - 10. Conduit shall be trade size 3/4-inch (19.1 mm) minimum. 1/2-inch conduit may be allowed if the contractor submits a specific request in writing.
  - 11. Conduit sleeves shall be used for all penetrations through fire rated or non-fire rated walls and partitions. Sleeves through fire rated walls shall be fire caulked on both sides of the wall and filled after cable installation. Sleeves shall be a minimum 2" diameter.
- M. Support all boxes by All-thread or other approved box support device; or bolt directly to building structural members. Do not support boxes to ceiling tie-wires.
- N. Provide red marking paint on support hardware.
- O. Fire alarm wire contaminated with paint shall be removed and repulled.
- P. Appropriate fire caulking or sealant shall be utilized where open cabling penetrations through fire separation barriers or building separation walls occur. Reference 07 84 00 – Firestopping.
- Q. Provide wet environment exterior rated cable for underground raceway or exterior cable applications. THHN cable is not acceptable for fire alarm wet locations.

### 3.2 LABELING

- A. All fire alarm devices shall have the room number/location description provided in the software programming. Example (Device Address) AHU-1 Return Room 201. RPS monitor modules shall have the room number included in the software description. When necessary to distinguish the locations of two or more detectors, compass directions shall be incorporated in the device location description in programming.
- B. Label each initiating device with device ID address (Manufacturer's format), and control module or monitor module with device ID address and circuit function [(Device Address), Strobes format]. Use Kroy lettering machine with ¼-inch minimum black lettering on clear background, unless alternate labeling approved by the Owner. Place label on initiating device base. DO NOT PLACE ON SENSOR.
- C. Label each concealed device location with device ID address and HVAC unit or module function [(Device Address) AHU-2 Duct Detector] or [(Device Address) FSD Room 201] format at the adjacent ceiling tile grid T-bar. Use plastic laminate with engraved ¼-inch lettering. Laminate shall be of red on white core construction (white lettering on red background), unless alternate labeling approved by the Owner.
- D. Label circuit terminations in panels and junction boxes with shrink wrap type written labels.
- E. Each wire shall be labeled with shrink wrap at each junction box and termination. The wire label shall be securely fastened to the circuit and shall indicate in minimum 12-point font typed lettering the circuit type (SLC, IDC, NAC, Power, etc.) in addition to the circuit number matching the as-built documentation. (For example: SLC Loop 1, IDC kitchen hood, IDC waterflow, NAC 1-4 or Power 3.)
- F. Label AES radio with account information and 120VAC circuit.

### 3.3 FIRE ALARM WIRE AND CABLE COLOR CODE

- A. Provide solid, copper, twisted Fire Alarm system conductors with size and insulation color codes as follows:
  - 1. SLC Circuit: 16AWG, Red Jacket with preprinted SLC (every foot)
  - 2. IDC Circuit: 16 AWG, Red Jacket with Brown Stripe
  - 3. 24 VDC Power Circuit: 14AWG, Red Jacket with Purple Stripe
  - 4. Notification Appliance Circuit (NAC):
    - a. NAC Strobe only Circuit: 14AWG, Red Jacket with Green Stripe
    - b. NAC Speaker only Circuit: 16 AWG, Red Jacket with Blue Stripe
  - 5. Network Circuit: 16AWG, Red with Yellow Stripe
  - 6. Relay Circuit: 16AWG, Red with Yellow Stripe
  - 7. Remote Test Station Circuit: 16AWG, Red with Yellow Stripe
  - 8. Miscellaneous Fire Circuit: 16AWG, Red with Yellow Stripe
  - 9. Fire alarm wire shall be one pair [Red (+)/Black (-)].
  - 10. Remote test station wire can be two pair [Red (+)/Black (-) and Yellow (+)/Green (-)]
  - 11. Left hand lay shall be a minimum of 4.
  - 12. Conductor sizing and numbers subject to equipment manufacturer recommendations.
  - 13. Fire alarm wire shall be unshielded unless required by manufacture.
  - 14. All 120VAC shall meet NEC standards.

### 3.4 DEDICATED CIRCUIT

- A. The fire alarm control panel shall be connected to a separate dedicated emergency branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. Fire alarm control panel primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold-water pipe or grounding rod.
- B. Provide dedicated circuits for fire alarm equipment.

### 3.5 FIELD QUALITY CONTROL

#### A. Construction Requirements:

1. Integrity of Structure: Do not drill or pierce structural members without prior approval from the University Project Manager and Structural Engineer.
2. Penetration of Walls, Etc.: Fire caulks or seal all penetrations made through walls, floors, and ceilings around the conduit. Maintain the integrity of fire ratings within the structure. Where visible, paint to match surface.
3. Wherever possible, install conduits and raceways in a concealed manner, except at surface-mounted cabinets.
4. Access to Existing Facilities: Install all conduit and pull boxes to maintain or provide access to existing valves; covers to existing pull boxes; wire ways or access doors; electrical outlets; switches; motors, etc.
5. Support bridle rings independently from structure, may have separate point of attachment to cable tray.
6. No other wiring or systems to be installed with fire alarm.
7. The addition or removal of any walls, doors, or other floor plan modifications will require the contractor to update the FACT graphics and graphic map at the FACP.
8. The building will be occupied during construction. Install the new fire alarm system prior to decommissioning/demolishing the existing system.

#### B. Fire Alarm System

1. Test in accordance with NFPA 72, Owner, State, and Authority Having Jurisdiction (AHJ) fire department requirements. Use Owner Record of Completion and Pretesting forms included in section 28 46 00.
2. Provide forty-eight (48) hours prior notice to the Engineer and Owner personnel for rough inspection, prior to installing ceiling tiles, devices, or drywall.
3. Provide seven (7) day prior notice to the Engineer and Owner personnel for scheduled contractor pre-testing of the system.
4. Provide three (3) day prior notice to the Engineer and Owner personnel for the scheduled Authority Having Jurisdiction (AHJ) testing of the system.
5. Provide three (3) original copies of the NFPA 72 - Certificate of Completion Form.
  - a. One for the Owner, one for the Authority Having Jurisdiction (AHJ), and one for the facility's Fire Alarm System Logbook.
  - b. Voltage and current values must be true measured values, not estimates.
  - c. Provide a table list of each Horn/Speaker location with actual measured dB per NFPA.
6. Provide two (2) detailed records of the pre-testing of the system.
  - a. One for the Owner and one for the facility's Fire Alarm System logbook.
  - b. Pre-testing record must contain a minimum of the device ID, proper annunciator description, proper functionality of the device (audible/visual signaling, shutdown, etc.), and date of the testing.
  - c. Utilize the standard Owner form available on the Owner website or provide Contractor equivalent form approved by the Owner in advance of the system pre-test.
7. Fire Alarm Contractor shall be responsible for coordination and employing the Controls Contractor to accomplish programming required between Fire and Security Alarm system and Building Automation system as well as connection of all interface circuits.

### 3.6 MANUFACTURER'S FIELD SERVICES

#### A. Prepare and start systems.

#### B. Include services of certified technician to supervise installation, adjustments, final connections, and system testing.

#### C. Provide two (2) hard copies and two (2) electronic copies in CD ROM or flash drive format of the final system programming. One set to be delivered to the Owner Project Manager for the Owner Central Reporting System programming, and one set to be left at the facility.

### 3.7 DEMONSTRATION

- A. Demonstrate normal and abnormal modes of operation and required responses to each.

### 3.8 TRAINING

- A. Provide the services of a factory-certified service representative to demonstrate the system and train Owner's maintenance personnel as specified below.
  - 1. On-Site Training: Provide a minimum of two (2) hours of on-site training of the facility's staffing in the basic operations and functionality of the access control / security system panel, and field devices. Review field panel locations, typically device locations, and 120vAC power locations (panels, breakers, and circuits). Demonstrate the various system responses to the field off-normal conditions. Simulate card access conditions, supervisory conditions, security conditions, trouble conditions, and ground fault conditions of the various field devices. Demonstrate how to reset various building systems (HVAC units, fire doors, security gates, etc.). Provide written instructions of basic system operating instructions in Fire Alarm Logbook, located adjacent to the fire alarm control panel.
    - a. On-Site System Training shall be completed within six (6) days of completion of the system and Owner Acceptance of the system.
    - b. Schedule on-site training with the Owner at least three (3) days in advance.
  - 2. Off-Site Training: Provide a minimum of eight (8) hours of off-site training of the Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, programming, and preventative maintenance of a system. The off-site training shall be conducted in a classroom type setting, with the content approved by the Owner in advance. Provide maintenance, service, and programming manuals of the various components of the system. Provide a working (panel and field devices) system demonstration unit; whereby the various system troubleshooting, and servicing procedures can be adequately performed in a "hands-on" scenario.
    - a. Off-Site System Training shall be completed within thirty (30) days of completion of the system and Authority Having Jurisdiction (AHJ) test and/or final Owner Acceptance of the System unless the Owner specifically directs and alternate training schedule.
    - b. Schedule Off-Site Training with the Owner at least fourteen (14) days in advance.

**END OF SECTION 28 05 00**



## **SECTION 28 46 00**

### **FIRE DETECTION & ALARM**

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

##### **1.1 GENERAL REQUIREMENTS**

- A. The requirements of the Contract Documents, including the General and Supplementary General Conditions, and Division 1 General Requirements shall apply to work of this Section.
- B. At the time of bid, all exceptions taken to these Specifications, any variances to the contract drawing design, and any nonconformance to the operating capabilities called for in this specification, shall be listed in writing and forwarded with the submission of the bid. Any such exception, variance, or nonconformance, which was not listed at the time of bid, and is identified in the submittal, shall be grounds for immediate disapproval without comment.
- C. Fire Alarm manufacturer shall be required to provide CU Anschutz a licensed copy of any software required to download, modify and maintain the system. Programming access codes shall not be given to the Owner until after the warranty period.

##### **1.2 SCOPE**

- A. The work covered by this Section of the Specification shall include all labor, equipment, materials, and services to furnish and install new AES radios and connect to the existing EST fire alarm control panels.

##### **1.3 RELATED SECTIONS**

- A. Section 07 08 00: Firestopping
- B. Section 26 05 00: Common Work Results for Electrical Systems
- C. Section 26 05 19: Low Voltage Electrical Power Conductors and Cables
- D. Section 26 05 26: Grounding and Bonding for Electrical Systems
- E. Section 26 05 29: Hangers and Supports for Electrical Systems
- F. Section 26 05 33: Raceways and Boxes for Electrical Systems
- G. Section 26 05 53: Identification for Electrical Systems
- H. CU Technical Guidelines
- I. Section 28 05 00: Common Work Results for Electronic Life Safety

##### **1.4 APPLICABLE CODES AND STANDARDS**

- A. Materials and workmanship shall conform to the latest issue of all industry standards, publications, or Regulations referenced in this Section, and with the following Codes and Standards, as applicable:
1. All equipment shall be listed and classified by Underwriters Laboratories, under the latest edition of the following standards:
    - a. Signaling Systems.
    - b. UL 268 – Smoke Detectors of Fire Protective Signaling Systems.
    - c. UL 268A – Smoke Detectors for Duct Applications.
    - d. UL 464 – Audible Signal Devices for Fire Alarm and Signaling Systems, Including Accessories.
    - e. UL1638 – Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories.
    - f. UL 1480 – Speakers for Fire Alarm and Signaling Systems, Including Accessories.
    - g. UL 38 – Standard for Manual Signaling Boxes for Fire Alarm Systems.
    - h. UL 346 – Standard for Waterflow Indicators for Fire Protective Signaling Systems.
    - i. UL 521 – Standard for Heat Detectors for Fire Protective Signaling Systems.
    - j. UL 1481 – Standard for Power Supplies for Fire-Protective Signaling Systems.
    - k. UL 1711 – Standard for Amplifiers for Fire Protective Signaling Systems.
    - l. UL 521 – Heat Detectors for Fire Protective Signaling Systems.
    - m. UL 864 – Control Units for Fire Protective Signaling Systems.
    - n. UL 1971 – Signaling Devices for the Hearing Impaired.
    - o. FM P7825a – Approval Guide Fire Protection
    - p. NFPA 70 - National Electrical Code Current Version adopted by the AHJ.
    - q. NFPA 72 - National Fire Alarm Code Current Version adopted by the AHJ.
    - r. IFC - International Fire Code. Current Version adopted by the AHJ.
    - s. IBC International Building Code. Current Version adopted by the AHJ.
    - t. IMC – International Mechanical Code. Current Version adopted by the AHJ.
    - u. ANSI S3.41 – Audible Emergency Evacuation Signals.
    - v. EIA ANSI/EIA/TIA2323 – Interface between Data Terminal Equipment and Data Circuit Terminating Equipment employing Serial Binary Data Interchange.
    - w. IEEE C6.41 – Surge Voltages in Low Voltage AC Power Circuits.
    - x. Technical Guidelines.
    - y. Local AHJ Amendments.
    - z. Americans with Disabilities Act (ADA)

## 1.5 SPECIAL REQUIREMENTS

- A. Definitions: “Furnish” shall mean “provide and install”. “Provide” means to supply all materials, labor, equipment, testing apparatus, controls, tests, accessories and all other items customarily required for the proper and complete application. “Install” means to join, unit, fasten, link, attach, set up or otherwise connect together before testing and turning over to Owner, complete and ready for regular operation. The words “accept” or “acceptable” denote only that the equipment items are in general conformance with the design concept of the project.

## 1.6 SUBMITTALS

- A. Reference 01 3300 – Submittal Procedures.
1. Shop Drawings: Provide shop drawings in compliance with NFPA 72 Chapter 7 including but not limited to:
    - a. Wiring diagrams showing all equipment, device placement, and wiring connection required.
    - b. One-line riser diagrams.
    - c. Device ID numbers (manufacturer’s format), room numbers, room descriptors, and compass direction (if applicable).
    - d. Zone schedules, operational matrix, and location of all end-of-line (EOL) devices.
    - e. Each initiating device and notification appliance device shall include signaling loop circuit or notification appliance circuit number and device ID numbers (manufacturer’s format) with preceding zeros.

- f. All system wiring shown on the floor plans.
- g. Include fire alarm control panel elevation view.
- h. FACP layout.
- i. Battery calculations.
- j. Sequence of operations.
- k. Equipment cut sheets.
- l. FAAP layout.
- 2. CADD generated layouts for FACT screen graphics.
- 3. Product Data: Provide manufacturer's data sheets showing product appearance, electrical characteristics, and connection requirements.
- 4. Load Calculations: Provide load calculations for all visual appliance circuits, audible notification appliance circuits, audible/visual notification appliance circuits, system power supplies, and battery standby systems.
- 5. Control Panels and Power Supply: Show fire alarm control panel layout, configurations, and terminations.
- 6. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use, as stipulated by the product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and start-up of products.
- 7. Submittals shall be reviewed and approved by architect, engineer and owner prior to submittal to AHJ.
- 8. Exceptions: Provide a detailed listing of any and all exceptions, variances, and non-conformances to the specifications and contract design drawings. Failure to disclose any such items shall be grounds for immediate disapproval of submittals without comment.
- 9. Samples: Provide samples of various items, when requested.
  - a. Provide a minimum of two (2) samples of all fire alarm cable to be installed on the projects. Cable samples shall be of sufficient length to identify cable marking (striping) and cable listing identification.
  - b. Provide a minimum of two (2) samples of all cable supporting devices, metal bridle rings, metal mounting brackets, plastic plenum rated wire bushings, and other applicable cable installation equipment to be utilized on the project.

## 1.7 CLOSEOUT SUBMITTALS

### A. Reference 01 7700 Closeout Procedures

### B. Record Drawings

- 1. Record "as-built" locations of all system components, initiating devices, signaling appliances, and end-of-line devices. Include "as-built" conduit routing and wire counts. The design engineer and Owner representative shall walk through the building and spot check 5-10% of device locations against the as-builts. If devices are not as shown, drawings will be rejected for a redraw. Upon resubmittal, another spot check will be performed. If deficiencies are found on the second check, an independent audit to the system by the system manufacturer shall be required. The contractor shall bear the cost of any such audit.
- 2. As-Built drawings shall consist of two hard copy bond sets and one electronic AutoCAD file copy on CD or flash drive format.
- 3. As-Built system load and battery calculations shall consist of two full size hard copy bond sets and one electronic copy on CD or flash drive format. Load calculations shall include all audible, visual, and audible/visual notification appliance circuits with calculated voltage drop levels, calculated maximum circuit distance measurements, actual recorded circuit length distance measurements, and actual measured voltage drop levels.
- 4. Provide electronic copy of all excel files (i.e. calculations, sequencing matrix, legend, etc.).
- 5. Provide two (2) hard copies of all system programming (software).
- 6. Provide two (2) electronic copies of all system programming (software); on CD ROM or flash drive format.
- 7. Provide Contractor redline construction drawing set, with mark-ups.
- 8. Provide two (2) full size hard copy bond sets of As-Built record drawing set.
- 9. Provide one (1) 11x17 hard copy bond sets of As-Built record drawing set.
- 10. Provide one (1) electronic copy of As-Built record drawing sets, on CD or flash drive format.
- 11. Provide all special test equipment, filters, test leads, cords, etc. required to test the system.

12. Record document box shall be located adjacent to FACP and shall contain contractor working set (actual field set – not cleaned up version) along with electronic copies as indicated above.
- C. Operation and Maintenance (O&M) Manuals
1. Operational Data: Provide operating instructions, detailed for the specific project.
  2. Maintenance Data: Provide maintenance and repair procedures for each type of equipment provided, as applicable. Include any specific requirements particular to the project.
  3. Equipment Data: Provide manufacturer data sheets or catalog sheets for each type of equipment provided.
  4. Spare Parts Data: Provide manufacturer's recommended spare parts list, including quantity, and any equipment replaced schedules, as applicable.
  5. Supplier Data: Provide system manufacturer and local service organization information. Include contact, phone numbers, and addresses, as applicable.
  6. Warranty Data: Provide system warranty information, including all material and/or labor terms.
- D. Warranty
1. The manufacturer shall guarantee the system equipment for a minimum period of one (1) year from the date of final acceptance of the system. Any additional warranty periods shall be listed in the Operation and Maintenance Data manuals. Any defective equipment, material, or software shall be replaced at no cost to the Owner during this warranty period.
  2. The installing contractor shall guarantee all wiring and raceways to be free from inherent mechanical or electrical defects for a minimum period of one (1) year from the date of final acceptance of the system. Any defective material and/or labor shall be replaced at no cost to the Owner.
- E. Spare Parts: See 01 78 46 Extra Stock Materials

## 1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with a minimum three (3) years' experience, and with service facilities within fifty (50) miles of the project.
- B. Shop Drawing Preparer: Company shall employ a NICET level 3 or 4 shop drawing preparer. Preparer shall sign shop drawing submittal.
- C. Project Supervisor: The installing company shall provide a full time project supervisor dedicated to the supervision of the fire alarm installation. The project supervisor shall have at least 5 years of experience installing addressable fire alarm systems. The project supervisor shall be on site at all times that the fire alarm system installation is in progress, including system testing.
- D. Project Engineer: Company shall employ an engineer of record with a registered P.E. in fire protection engineering, or a registered P.E. in a related engineering discipline, with a minimum of four (4) years' experience in fire protection and alarm engineering, or a minimum NICET Level 3 Project engineer.
- E. Installer: Installing Company shall use only an Owner Approved EST dealer for programming and final testing. The Bidding Company must specialize in installing the products specified in this section with a minimum five (5) years documented experience. The installer shall employ NICET Level 2 trained technicians to install the products specified in this Section.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. APPROVED INSTALLERS

1. ADT, Rockies Life Safety Division, 6510 Franklin Street, Denver, CO 80229, (303) 298-7900
2. Convergent – 7330 S. Alton Way, Suite 12K, Centennial, CO (303) 932-0757
3. Meridian Fire and Security – 10200 East Easter Avenue, Centennial, CO 80112 (303) 790-2520
4. ETG Fire – 7700 E Iliff Ave # G, Denver, CO 80231 (720) 504-9700
5. Other Edward System Technology installers will be considered if they have successfully completed 3 similar projects (in size and complexity) in the past 5 years in the Denver Metro area and NICET certified. Installer must demonstrate ability to provide ongoing service to any system it installs. Other installers must be approved in writing by the University Project Manager prior to bidding on the project. University approval takes 5 business days.

2.2 MATERIALS

A. Fire Alarm Control Panel (Existing)

B. Power Supplies (Existing)

C. Standby Batteries: The secondary power source shall be standby batteries. Batteries shall be sealed lead acid type, with a minimum life expectancy of five years, and shall provide twenty four (24) hours of normal standby operation and five (5) minutes of normal alarm condition at the end of the standby period. System can use four (4) hour battery system if the site has an Automatic-starting, engine-driven generator serving the dedicated branch circuit of the fire alarm system arranged in accordance with NFPA 72 10.5.10.3.1

1. Batteries shall be dated with month and year of installation in the system as well as manufacture date.
2. Dedicated battery cabinets (when required) shall be located below the fire alarm control panel. Do not locate these panels above finished ceilings.

D. System Design Parameters:

1. Fire Alarm Class A Device Initiating Loop (SLC) Circuits: The analog/addressable device loop (SLC) circuit shall be power limited, electronically supervised and shall be monitored for active (short), trouble (open), and ground fault conditions. The analog/ addressable loop (SLC) circuit shall provide all power, signaling and polling communications to the analog detectors and addressable modules connected to it, and shall monitor all sensors for their analog values, environmental compensation levels, and maintenance conditions. The analog/ addressable device loop (SLC) circuit shall monitor all devices for trouble and alarm conditions and shall place the circuit in trouble mode; but shall not disable any device from initiating an alarm of trouble signal to the fire alarm control panel. The analog/ addressable device loop circuit shall be Class A (Style 7) type.

E. ANSCHUTZ MEDICAL CAMPUS SYSTEM LAYOUT (EXISITNG)

1. General:
  - a. All campus buildings will be equipped with a FACP. Locate near the main entry and a
  - b. FVEP located near the FACP per the building design, for all non high-rise buildings.
  - c. Each FACP shall be networked into the campus network and accessible from the Campus FACT. Any FVEP shall be accessed from the Campus FCC FVEP microphone and/or the Campus Police Station FVEP microphone.
  - d. One FACP and FACT in one university high-rise building FCC and one university high- rise building FCC will be designated alternate locations for the Campus FCC FACP. All information residing in the FACP/FACT of the Campus will be duplicated at these two locations.
  - e. A FACT with FAP or a FAAP with LCD indicating building in alarm shall be located at the University Police Building. The Police Station shall be capable of accessing any FVEP via local microphone.
  - f. Every building will be equipped with a weatherproof speaker/strobe located at each exterior door.
  - g. Include the Following Front Panel Controls:
    - 1) Each floor shall have a disable button
    - 2) Elevator disable

- 3) Fan/shut-down disable
- 4) Pager disable
- 5) Door disable
- 6) Separate speaker and strobe disable
- 7) Manual page by floor
- 8) NETCOM DISABLE
- 9) BAS DISABLE
- h. Provide interface with the Building Automation System to report all “alarm” and “supervisory” actions. Refer to Division 23.

F. OFFSITE SIGNALING

- 1. DACT (Existing)
- 2. Radio Transmitter: AES Subscribers transmit consolidated alarm, waterflow, trouble, supervisory, and carbon monoxide signals triggered by a FACP output relay. Transmitter shall send full zone codes captured off a panel’s digital communicator. Transmitter shall meet UL and NFPA 72 requirements. Provide new AES dedicated outlet with cover. Utilize fire alarm control panel 120VAC circuit.
  - a. AES radio shall be installed with and maintain a NetCon 5 value.
  - b. AES radio shall be the latest technology and include an integrated onboard local annunciator.
  - c. Rubber Duck antennas (PN 7214) are preferred by the owner. Exterior, high gain antennas shall only be installed where necessary to achieve a NetCon 5 value.
  - d. Furnish 16.5VAC 40VA transformer with 1640-ENCL enclosure. Install in accordance with the manufacturers installation manual.
  - e. All cable shall be installed in conduit.
  - f. Furnish tamper proof screws.
  - g. Penetrations through fire rated walls shall be fire caulked on both sides of the wall.
  - h. Contractor shall submit radio coverage maps showing nearby antenna locations and types.
  - i. External antenna mounting requirements.
    - 1) Shall be at least 18 inches above the roof line.
    - 2) Shall be at least 10 inches away from any parapet, wall, or obstruction.
    - 3) Shall have 360-degree visibility.
    - 4) Antennas must be plumb when mounted.
    - 5) Furnish lightning protector as close to the antenna as possible (PN 7230).
    - 6) RG-58 cabling shall run no longer than twenty-five feet (25’).
    - 7) RG-8 cabling shall run no longer seventy-five feet (75’).
    - 8) LMR-400 (LMR-600preferred) cabling shall run no longer than one-hundred twenty-five feet (125’).
    - 9) Provide 12-inch service length.
    - 10) No tight bends smaller than a 6 inch radius.
    - 11) External antenna locations shall be approved by AHJ prior to installation.
    - 12) Roof penetration shall be coordinated with roofing contractor and be in liquid tight conduit and fittings with flashing suitable for wet locations.

2.3 FIRE ALARM SYSTEM SEQUENCE OF OPERATION (EXISTING)

- A. Alarm Sequence of Operation: Operation of any alarm initiating devices shall automatically:
  - 1. Sound local audible signal and display red common alarm LED.
  - 2. Sound audible notification appliances throughout the building.
  - 3. Flash visual notification appliances throughout the building.
  - 4. Sound/flash the exterior Fire Dept Response Point horn/strobes.
  - 5. Indicate the device in alarm on the fire alarm control panel and remote annunciator.
  - 6. Indicate the location of alarm zone (floor and area) on fire alarm control panel and remote annunciator.
  - 7. Alarm signal transmitted to Owner central stationing receiver.
  - 8. Alarm signal transmitted to e-mail list

9. Manual acknowledgement function at the fire alarm control panel silences local audible alarm. Visual alarm condition is displayed until alarm condition is restored and panel is reset.
- B. Duct Smoke Detector Sequence of Operation: Operation of any duct smoke detector shall automatically:
1. Sound local audible signal and display yellow common supervisory LED.
  2. Indicate the device in supervisory on the fire alarm control panel and remote annunciator.
  3. Indicate the location of supervisory zone (floor and area) on the fire alarm control panel and remote annunciator.
  4. Supervisory signal transmitted to Owner central station receiver.
  5. Shutdown all HVAC unit(s) associated with the duct smoke detector zone, as required by the AHJ.
  6. Delay for 60 seconds then close smoke/fire damper(s) associated with the specific HVAC system ductwork, as required by the AHJ. On reset allow 60 second delay of HVAC unit for dampers to open first.
  7. A manual acknowledge function at the fire alarm control panel silences local audible alarm. Visual supervisory condition is displayed until supervisory condition is restored.
- C. Trouble Sequence of Operation: The entire fire alarm system wiring shall be electrically supervised to automatically detect and report trouble conditions to the fire alarm panel. Any opens, grounds, disarrangement of system wiring on alarm initiating circuits, opens, shorts, grounds, or disarrangement of system wiring on alarm notification appliance circuits, or device trouble or maintenance conditions, shall automatically:
1. Sound local audible signal and display yellow common trouble LED.
  2. Indicate the device in trouble on the fire alarm control panel and remote annunciator.
  3. Indicate the location of trouble condition, as applicable, on the fire alarm annunciator.
  4. Trouble signal transmitted to Owner central station receiver.
  5. Manual acknowledgement function at the fire alarm control panel silences local audible signal. Visual trouble condition is displayed until the trouble condition is restored.
- D. Failsafe Operation: To increase the system's ability to survive damage from fire, malicious or accidental damage, premature component failure, etc., the fire alarm system shall provide the following functionality:
1. Each building FACP shall operate in a stand-alone manner, independent of any other FACP or FACT. The building FACP shall contain the complete data file for all connected devices, regardless of the building, and shall operate the same way whether connected to any other FACP or FACT. This includes:
    - a. Annunciation of device address and condition. One hundred percent of all connected devices shall be capable of operating for alarm simultaneously.
    - b. Logical Point Grouping annunciation and control. Each Logical Point Group shall contain up to 15 physical points and shall be capable of initiating a sequence of control actions.
    - c. Event-initiated control, signaling and/or annunciation sequences. One hundred percent of all connected devices shall be capable of being operated simultaneously.
    - d. Priority display of multiple alarms.
    - e. Complete supervision of all connected devices with no degraded operation.
    - f. Complete reset capabilities at FACP and FACT.
  2. Standby batteries capable of operating the FACP, FACT (except those supported by non- interruptible power supply systems), FAAP, FVEP, smoke detectors and alarm horns, strobes, secondary PC terminals, video display units and printers, shall be provided to automatically back up the emergency power source. The system shall have the capacity to operate FACP, as required per NFPA PCs for two hours, and then operate the fire alarm indicating devices for at least 15 minutes, per NFPA requirements. When commercial power is restored, the system shall transfer automatically to primary power. System power supply shall be equipped with battery charging circuits sufficient to recharge fully depleted batteries to within 70 percent of their maximum capacity within 12 hours.
  3. System operating software and data file shall be resident in nonvolatile memory. Loss of power, momentary or for a sustained period shall not require reloading of the software.
  4. All plug-in circuit boards shall be electrically supervised to assure that the proper board is in the proper position. Systems that use electrical continuity to supervise the presence of plug-in boards, but that do not assure that board positions have not been exchanged, shall provide additional means for the specified supervision, beyond that provided by locking covers.
  5. The FACT shall be provided with battery backup or individual dedicated UPS.

- E. Alarm Reset: System remains in alarm mode until alarm condition is restored and fire alarm system is manually reset with key-accessible reset function. System resets only if initiating circuits are out of alarm. On reset allow 60 second delayed startup of HVAC unit for dampers to open first.
- F. Alarm Silence: System audible and visual notification appliances remain sounding/flashing until the fire alarm system is manually silenced with a key-accessible alarm silence function. Visual notification appliances remain flashing until the fire alarm system is manually reset as described above. System audible and visual notification appliances shall resound/flash upon reactivation of alarm silence function.
- G. Lamp Test: A manual lamp test function causes alarm indication of each alarm, trouble and/or system LED at the fire alarm control panel and remote annunciators upon activation of key-accessible lamp test function. Alarm indication of LEDs shall turn off upon reactivation of lamp test function, or upon automatic timeout.
- H. Normal operator interface, through the FACP located in each individual building where required, and at the designated FACT located in the Anschutz Medical Campus University Police Building in the Police Dispatch. All system early-warning pre-alarm, alarm, and trouble messages shall be annunciated on the FACT in a color-graphic format with English language descriptors.
- I. The FD will respond to the FACP of the building in alarm and to the Campus Police. The Campus Police FACT shall be automatically activated into the graphics mode to show the current status of all devices in alarm. The FD will take command of the Building's FACT to monitor the current response to the fire alarm condition. Using a "mouse driven" graphic menu, the FD shall be able to "zoom in" or "zoom out" of the graphic screens to view the current alarm condition.
  - 1. The FD will use the building's FCC PC graphic system to view and control the response of the fire alarm system by viewing special graphic screens such as:
    - a. Any building within the complex connected to the fire alarm system.
    - b. Any preprogrammed screen existing within the fire alarm system.
    - c. Or other specialty screens that may be created at the request of the university Facilities Operations.
  - 2. Using the assigned FD Identification Code (ID password), the FD may use the FCC PC to alter the preprogrammed fire fighting response to the present alarm condition. A printer will provide hard copy documentation of all alarm conditions, ID password log on commands, and the system response to the specific fire alarm condition.
- J. The Campus Control Center fire alarm computer will provide monitoring and secondary back up of the fire alarm computers located in the various fire command centers. If an equipment trouble alarm is initiated from a fire alarm device, it shall be reported at the FCC FACP of the building in alarm and the Campus Control Center PC.
- K. If a fire alarm condition is received and the FD cannot initiate an appropriate response from the building's FCC PC (i.e., fire in the Buildings' FCC room, or a failure of the FCC PC), then an override ID password command can be used by the FD to make any system PC the primary PC for the manual fire fighting override response. The selected PC shall be able to alter a building's preprogrammed response to the alarm condition. The selected PC shall be able to access and control all PC graphic screens that reside within the system.
- L. It shall be possible for all authorized personnel, using the proper ID password, to place the facility into smoke control operation through the graphic screens from the University Police (FACT), or the Building's FCC FACP.

#### 2.4 ANNUNCIATORS (EXISTING)

#### 2.5 GRAPHIC DISPLAY MAPS (EXISTING)

#### 2.6 INTELLIGENT MODULES – GENERAL



- A. The system modules shall be capable of full digital communications using polling protocol and shall be individually addressable. The modules shall have a separate means of displaying communication and alarm status. As a minimum, each module shall have a flashing LED to indicate communications status, and a red LED to indicate alarm or active control status of the module. The modules input and output circuit wiring shall be supervised for opens and grounds faults, and shall be suitable for operation in the following environment:
  - 1. Temperature: 32 degrees F to 100 degrees F
  - 2. Humidity 93% RH, non-condensing
  - 3. Elevation: No limit
  - 4. Do not mount intelligent modules above finished ceilings. The intelligent monitor and control modules shall be mounted so that the LED is visible.
    - a. Dual modules are not allowed.
  - 5. Multi-input modules shall not be acceptable unless each input has a distinguishable color or pulse.
- B. Fire Alarm Initiating Devices
  - 1. Intelligent modules must be mounted at a height accessible from a 6' ladder from a finished floor.
  - 2. Control Relay Module: Provide intelligent addressable control relay module. The control module shall mount to a standard electrical box or trim ring, and shall provide one (1) Form "C" dry relay contact, rated at 2 Amps at 24vDC or 0.5 Amps at 120vDC; to control external appliances or equipment shutdown. The control relay module shall be rated for "pilot duty" and releasing systems.

## 2.7 FIRE ALARM INTEGRATED AUDIO/VISUAL EVACUATION SYSTEMS (EXISTING)

## 2.8 ANCILLARY DEVICES (EXISTING)

## 2.9 FIRE ALARM WIRE AND CABLE

- A. Fire Alarm Power Branch Circuits: Building wire as specified in Section 26 05 19.
- B. Fire Alarm Initiating Device Loop (SLC) Circuits and Notification Appliance (NAC) Circuits: as specified in Section 28 05 00.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Route cables such that a minimum separation of ½" is maintained between Class 1 wire and power-limited fire alarm circuits. Provide separate relay where 120VAC is required to release fire/smoke dampers, or similar.
- C. Provide panel breaker locks for all electrical circuits for fire alarm and detection control equipment panels. Fire alarm and detection circuit breaker locks shall be color coded red. Breaker Locks shall be Space Age Part Number: ELOCK-FA.
- D. Label each device as specified in Section 28 05 00.
- E. Fire alarm contractor shall provide up to five (5) fire alarm system programming downloads in his base bid price, to accommodate the required phasing for the project. Fire alarm contractor shall furnish a unit price for one (1) lot of system programming and download for additional system downloads as part of his bid.

- F. Always maintain a fully functioning fire alarm system. Coordinate transfer with Owner and engineer of record in writing.

### 3.2 FIRE ALARM WIRE AND CABLE COLOR CODE

- A. Provide fire alarm circuit conductors with insulation color coded as specified in Section 28 05 00.

### 3.3 FIELD QUALITY CONTROL

- A. Test in accordance with NFPA 72, Owner, State, and Authority Having Jurisdiction (AHJ) fire department requirements. Use Owner forms for record of completion.'
- B. Contractor shall utilize Bluebeam Session (provided by TLH Fire) to respond to rough wire and testing observation punch list items. Contractor shall attach pictures confirming completion (picture settings shall be set to high quality).
- C. Provide forty-eight (48) hours prior notice to the Engineer and Owner personnel for rough Inspection, prior to installing ceiling tiles or drywall.
- D. Provide seven (7) day prior notice to the Engineer and Owner personnel for scheduled contractor pre-testing of the system.
- E. Provide three (3) day prior notice to the Engineer and Owner personnel for the scheduled Authority Having Jurisdiction (AHJ) testing of the system.
- F. Provide three (3) original copies of the Owner Certificate of Completion Form. One for the Owner, one for the Authority Having Jurisdiction (AHJ), and one for the facility's Fire Alarm System Logbook. Utilize the standard Owner form available on the Owner website
- G. Provide two (2) detailed records of the pre-testing of the system: One for the Owner and one for the facility's Fire Alarm System logbook. Pre-testing record must contain a minimum of the device ID, proper annunciator description, proper functionality of the device (audible/visual notification, HVAC shutdown, etc.), and date of the testing. Records must be typed in numerical order by device address and include a report generated by the fire alarm control panel. Utilize the standard Owner form available on the Owner website. Pre-testing records shall be included as part of the Record of Completion.
- H. Contractor to provide ear protection for occupants during fire alarm testing.

### 3.4 MANUFACTURER'S FIELD SERVICES

- A. Prepare and start systems.
- B. Include services of factory trained and certified technician to supervise installation adjustments, final connections, and system testing.
- C. Provide two (2) hard copies and two (2) electronic copies in CD or flash drive format of the final system programming. One set to be delivered to the Owner Project Manager for the Owner Central Reporting System (Building Automation) programming, and one set to be left inside the facility's Fire Alarm System logbook.

### 3.5 DEMONSTRATION

- A. Demonstrate normal and abnormal modes of operation and required responses to each.

### 3.6 TRAINING

- A. Provide the services of a factory certified service representative to demonstrate the system and train Owner's maintenance personnel as specified below.
  - 1. On-Site Training: Provide a minimum of two (2) hours of onsite training of the facility's staff and Maintenance personal in the basic operations and functionality of the fire alarm system panel, annunciator, and field devices. Review field panel locations, typical device locations, and 120vAC power locations (panels, breakers, and circuits). Demonstrate the various system responses to the field off-normal conditions. Simulate alarm conditions, supervisory conditions, security conditions, trouble conditions, and ground fault conditions of the various field devices. Demonstrate how to reset various building systems (HVAC units, fire doors, security gates, etc.). Provide written instructions of basic system operating instructions behind clear Lexan framed glass, located adjacent to the fire alarm control panel.
  - 2. Offsite Training: Provide a minimum of eight (8) hours of offsite training of the Owner's maintenance personnel in the procedures involved in operating, trouble shooting, servicing, programming, and preventive maintenance of the system. The offsite training shall be conducted in a classroom type setting, and programming manuals of the various components of the system. Provide a working (panel and field devices) system demonstration unit; whereby the various system troubleshooting and servicing procedures can be adequately performed in a "hands-on" scenario. This is per project and can acuminate training time from several projects to allow more detailed instruction.
- B. Onsite System training shall be completed within six (6) days of completion of the system and Authority Having Jurisdiction (AHJ) test. Offsite System training shall be completed within thirty (30) days of completion of the system and Authority Having Jurisdiction (AHJ) test, unless the Owner specifically directs an alternate training schedule.
- C. Schedule the onsite training with the Owner at least three (3) days in advance. Schedule the offsite training with the Owner at least fourteen (14) days in advance.

**END OF SECTION 28 46 00**

## PROJECT SCOPE/NARRATIVE

The Fire Alarm Contractor shall install (1) 7177H-88-ULP AES w/IP unit in building A and (1) 7177H-88-ULP AES w/IP unit in building B to establish the initial mesh network as well as to meet NFPA 72 2016 26.6.5.2.6(B) requirements. Additional 7177H-88-ULP AES w/IP units will be installed if necessary in outlying schools to reach NETCOM 5.

The Fire Alarm Contractor will continue to install (1) 7707P-88ULP-M AES unit at the remaining (52) locations based on the project install schedule. A site evaluation will be performed at each location prior to installing the unit to determine the best location for the unit to maintain proper communication with the mesh network. Antennas will be added to the schools with insufficient NetCon Values. A 10% test will be completed at each school to verify alarm, supervisory and trouble signals (point contact ID) transmission to monitoring.

## 7177 Hybrid 2.0 Subscriber

# HYBRID

### UL Approved

- Features dual functionality
- Acts as a network bridge
- Extends network coverage



### Overview

The new **AES 7177 Hybrid** 2.0 Subscriber includes the AES-IntelliPro full data module and IP Link capabilities.

Wi-Fi Internet comes standard! The Hybrid subscriber provides the capability to send an alarm from the Customer premises to the Central Monitoring Station (CMS) via RF and/or IP AND transmit peer signals via IP.

The Hybrid subscriber was developed in response to valuable dealer feedback. It is a cost effective solution designed to improve the health of an existing network, start a new network where there is no Radio Frequency (RF) coverage, and reduce local RF congestion due to geographical conditions.

## Key Features

- Backlit LCD with automatic turnoff, Power and Trouble LEDs, and Menu/Silence button on chassis door
- Integrated Tamper Switch connected to one of the available dry contact zones
- External Wi-Fi antenna on chassis
- Antenna Supervision Module (ASM) with dedicated connector
- Integrated AES Certified FACP Adapter for flexible power options
- Integrated AES-*IntelliPro* full data module
- Integrated Local Annunciator on chassis
- Local upgradable software via USB, smartphone, tablet, or PC (legacy HandHeld Programmer no longer needed)
- Available in choice of 8 isolated dry contact zones or 4 isolated dry contact zones and 4 isolated reverse polarity zones; one zone is reserved for Tamper Switch

## Key Benefits

- Automatically forwards peers RF traffic through the RF mesh when the Internet connection to the MNR is down
- Extends network coverage when installed on the edges of an existing mesh network
- Communicates to all types of Subscribers on the AES network
- Sends outbound messages initiated from IPCtrl just like a conventional subscriber

## Models

Hybrid 2.0 Subscribers	
2.0 HYBRID	
7177H-88-ULP	Hybrid 2.0 Subscriber, 8 Zone (isolated dry contact) Fire unit with AES- <i>IntelliPro</i> included and IP Link capabilities
7177H-44-ULP	Hybrid 2.0 Subscriber, 4x4 Zone Fire unit with AES- <i>IntelliPro</i> included and IP Link capabilities
<i>The 7177 Hybrid comes standard with integrated AES-IntelliPro full data module and Wi-Fi Internet, no need to order 7794A standalone or 77-WiFi adapter separately</i>	

## DIMENSIONS

13"H x 8.5"W x 4.5"D  
(33cmH x 21.5cmW x 11.4cmD)

## WEIGHT

5.8 lbs (2.6 kilograms) excluding battery, 13 lbs (5.9 kilograms) with 12 Ah battery

## RADIO FREQUENCY

Standard Frequency Range:  
450-470 MHz  
Contact AES for other UHF and VHF frequencies

## ANTENNA

2.5 dB tamper resistant antenna included, mounts on enclosure, and optional remote mounting antenna available

## FLEXIBLE POWER

16.5VAC and battery  
24VDC and battery\*  
24VDC only\*  
\*(requires FACPA for isolation)

## BACKUP BATTERY

12 Ah, UL recognized lead acid gel cell, size based on subscriber configuration

## ALARM SIGNAL INPUTS/ZONES

- 8 isolated dry contact zones or 4x4 option with 4 isolated dry contact zones and 4 isolated reverse polarity zones; 1 zone is reserved for Tamper Switch
- 7794A AES-*IntelliPro* full data module included for Contact ID, and Pulse

## UL LISTINGS

- UL 864 Standard for Control Units & Accessories for Fire Alarm Systems, Edition 10
- CAN/ULC S559 Equipment for Fire Signal Receiving Centres and Systems, Edition 2
- FCC-B emissions recognized

## TROUBLE OUTPUT—ACK DELAY/ANTENNA CUT

Form C relay, fail secure, rated 24V DC 1A resistive, unsupervised

## RESET BUTTON

Located on main circuit board

## OPERATING TEMPERATURE

32 to 120°F (0 to 49°C)

## STORAGE TEMPERATURE

14 to 140°F (-10 to 60°C)

## RELATIVE HUMIDITY

0 to 93%, non-condensing

## PORTS

(2) USB ports

## ANNUNCIATOR

Integrated Local Annunciator (Remote Annunciator accessory available)

## COMPATIBLE RECEIVERS

7705i, 7705i-C, 7705ii, and 7705ii-C AES-*MultiNet* Receivers

## CONFIGURATION INTERFACE

Web browser capable device accessible via smartphone, tablet, laptop, or PC

## CURRENT CONSUMPTION

Standby = 0.4A  
Standby + Charging = 1A  
Transmitting = 1.4A

## POWER OUTPUT

2 Watts, Factory set  
Contact AES for other options

## ENCLOSURE MATERIAL

Steel with paint finish

## FINISH COLOR

Red

## VISUAL INDICATORS

Front panel LCD (2 x 20 alphanumeric character backlit display with automatic turnoff), Buzzer, Power and Trouble LEDs (ALM, Trouble, Tx, Rx, WA), Menu/Silence button

## ANTENNA SUPERVISION

Antenna is connected to dedicated Antenna Supervision Module (ASM) for constant antenna supervision.



For details or to learn more about our products and service offerings, please call your local AES Sales Representative at (800) 237-6387 or email [sales@aes-corp.com](mailto:sales@aes-corp.com).

## About AES Corporation

AES Corporation is the leading manufacturer of code compliant wireless alarm communication products and solutions serving commercial security markets and government agencies worldwide. AES-IntelliNet® patented technology will never sunset compared to obsoleting technologies such as cellular and traditional phone lines. AES private mesh radio networks are owner operated and controlled, providing superior reliability with the fastest transmission speed available. Over a half million AES Subscribers are installed worldwide. AES is the clear choice for life safety and security, protecting people and property for over 40 years.



[www.aes-corp.com](http://www.aes-corp.com)



IP Connectivity:  
PRIMARY RECEIVER

Press the **MENU** button to view the next message.

### Panel Interface Status

The alarm panel interface is shown.

Panel Interface:  
None

Press the **MENU** button to view the next message.

### 7794A IntelliPro Software Version

If a 7794A IntelliPro is installed in the Hybrid, the software version will appear as shown below, where X.XXX is the version number:

Panel Interface:  
7794A Ver X.XXX

When no 7794A is present, the display will show **None** as shown below:

Panel Interface:  
None

Press the **MENU** button to return to the home screen, which is the System Status Display.

### 8.13 Off-Normal Operation

Faults and alarms that cause off-normal operation are shown with fault messages in the LCD display. See table below for more information.

Table 6. Faults and Alarms with Off-Normal Operation	
Off-Normal Condition Fault Message	Problem
AC POWER FAIL	AC power to Hybrid disconnected or below minimum voltage
DC POWER FAIL	DC power to Hybrid disconnected or below minimum voltage
CHARGER	Battery charger failure
NETCON	Hybrid NetCon value below minimum required
GROUND FAIL	Resistance to earth ground below limit on zone input
AP IFACE FAIL	7794A IntelliPro card failure
RF COMM FAIL	Failure to communicate with another unit on mesh network
ANNUNC FAIL	7740 Remote Annunciator failure
BATTERY FAIL	Backup battery voltage below minimum
Alarm/Trouble Messages	

Table 6. Faults and Alarms with Off-Normal Operation	
Off-Normal Condition Fault Message	Problem
ZONE 2 ALARM	Example of Alarm condition; Zone 2 input
ZONE 7 TRBL	Example of Trouble condition; Zone 7 input

### Fault Display

Faults are shown on the LCD display on the enclosure. The following behavior occurs depending on whether single or multiple fault conditions exist.

- **Single fault** – A single fault condition is shown on the display, and the Hybrid buzzer sounds as shown below:

```
7177      VER:X.XXXX
Status: AC FAIL
```



When the single fault condition clears, the cleared fault message no longer displays and the buzzer stops sounding.

- **Buzzer Silence** – Press the **MENU** button and *hold down* for at least 5 seconds. The status display will show the following, and the buzzer will be silenced.

```
7177      VER:X.XXXX
Status: SILENCED
```

- **Multiple faults** – Multiple faults are shown in the LCD display one fault at a time for approximately 2 seconds each. Faults appear in sequential order, and the Hybrid buzzer sounds as shown below:
- **Buzzer Silence** – Press the **MENU** button and *hold down* for at least 5 seconds.

### 8.14 Disable On Board Buzzer

The front panel buzzer can be disabled through the configuration interface if a remote annunciator is used. To disable the onboard buzzer in the Hybrid:

1. Select the **System** tab.
2. Under the **Buzzer** panel, set the **On Board Buzzer** switch from **Enabled** to **Disabled** to silence the buzzer.
3. Click the **Save Change** button.
4. Click **Update**.

### 8.15 Hybrid Status Check

#### General

Information about the Model 7177 Hybrid is shown in the **Status** panel. The Hybrid model, firmware version, and status can be viewed by selecting the **Status** tab as shown in red below:



The Hybrid model number and software version are displayed:

7177 HYBD Ver:

The **Status** page shows any faults, (Status) as well as the unit (Sub) ID, Link Layer, Hybrid Link Layer, NetCon and IP Connectivity values:

7707 Fire Subscribers

**IntelliNet 2.0**

## A Newer, Smarter Alarm Communications Platform

### Feature Highlights

- Leverages state of the art technology
- Applies advanced security protection
- Offers flexible power and configuration options
- Engineered for backward compatibility with legacy systems
- Enables future ready capabilities
- Provides instant subscriber status through front panel with Power and Trouble LEDs, a backlit LCD display, and Menu/Silence button
- Includes robust Multiple Communication Technologies (MCT) feature
- Emulates virtual keypad
- Improves functionality with an adaptive Graphic User Interface (GUI) for programming via smartphones, tablets and PCs
- Plus many more...



### Key Benefits

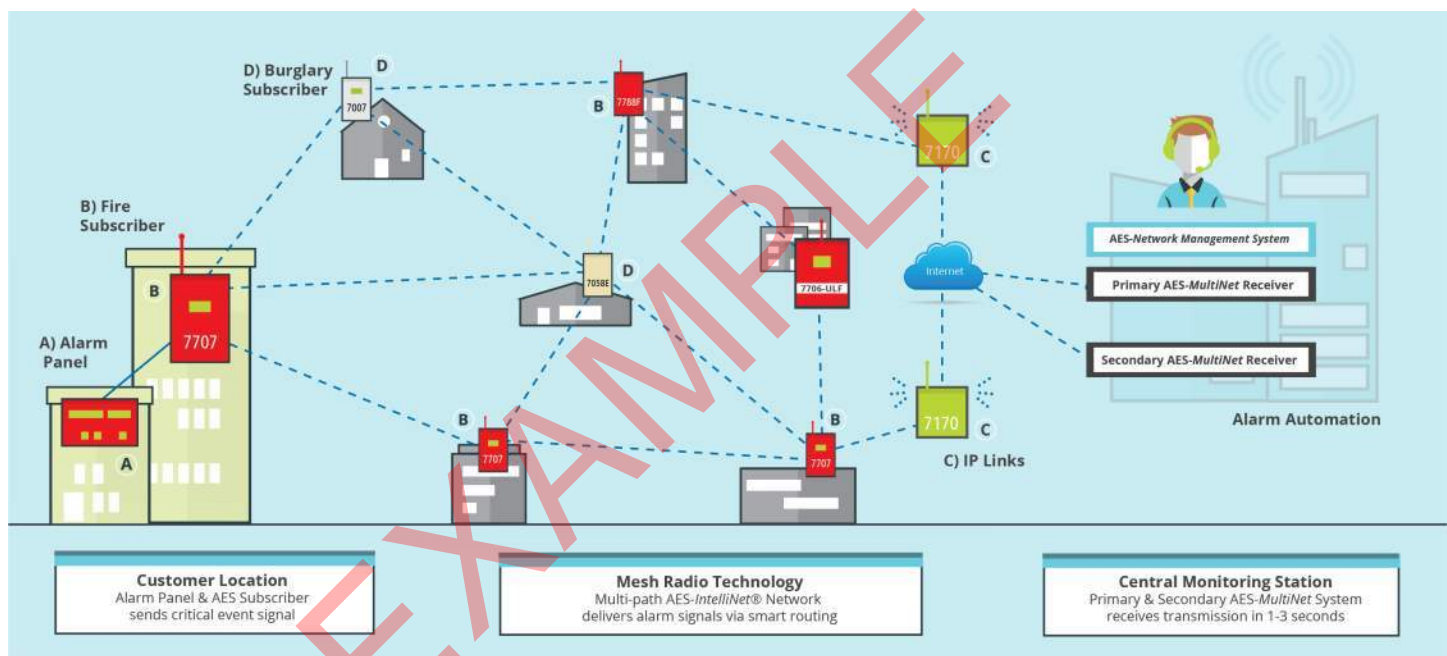
- Built upon the solid foundation of AES-IntelliNet patented mesh radio technology for use in private licensed wireless networks
- Protects subscriber units against unauthorized access and rogue activity with a password-protected Dealer Code
- Makes programming and streamlined troubleshooting easy with user friendly interface
- Adds integrated supervision of AES-IntelliPro full data module
- Provides versatile power options:
  - (1) Direct from the Fire Alarm Control Panel (FACP) without requiring an electrician onsite and without Subscriber backup battery;
  - (2) Directly from the FACP with Subscriber backup battery; or
  - (3) Traditional installation with plug in Class 2 low power transformer
- Allows for enhancement upgrades and an expanded number of new features to be added easily with highly flexible and scalable alarm communications infrastructure
- Rigorously tested to the highest industry standards and future ready to meet emerging NFPA code and UL standards

## Enhanced Wireless Fire Alarm Monitoring

Powered by AES enhanced mesh radio technology, *IntelliNet* 2.0 7707 Fire Subscribers are next generation universal wireless communicators that provide advanced security protection for any new or existing alarm monitoring network. The AES Model 7707 is ideal for commercial fire applications. With the AES-*IntelliPro* full data module option, they are the ideal drop-in replacement for Plain Old Telephone Service (POTS) lines.

The red metal enclosure comes with a key lock and front panel LCD backlit display with intuitive view that provides an instant visual of the subscriber status. The user friendly GUI makes it easy to program AES subscriber units via a smartphone, laptop, tablet, or integrated Universal Serial Bus (USB)—without the need for special cables or having to use a handheld programmer. Additional knockouts make it easier to mount for faster installation.

## *IntelliNet* 2.0 Private Wireless Mesh Radio Network



The *IntelliNet* 2.0 Fire Subscriber has an 8 Zone modular design for expansion with normal and reverse polarity, POTS and DACT interfaces with an option for the 7794A AES-*IntelliPro* full data module add-on accessory board. AES subscribers' intelligent software automatically detects new hardware and devices to reduce installation time.

An AES certified WiFi accessory allows seamless wireless connectivity for configuration and programming. A laptop, Ethernet cable, or a Wi-Fi USB dongle is required for *IntelliNet* 2.0 programming, handheld programmers will not work with 2.0 units. A FACP Power Supply Adapter is required for certain configurations when using flexible power options. The forward compatible design allows for feature add-ons, engineered to adapt seamlessly with future software upgrades as technology advances. *IntelliNet* 2.0 allows configuration cloning for faster installation time.

The AES 7707 was designed with quick configuration and installation in mind to make it easier for field technicians to get in, out, and on to the next install.

Visit our Fire Marshal Resources web page for official NFPA and UL Listings:

<https://aes-corp.com/products/fire/fire-marshall-resources>

<b>IntelliNet 2.0 Fire Subscribers</b>	
<b>2.0 PREMIUM (UL &amp; ULC Listed)</b>	
7707P-88-M	<i>IntelliNet 2.0 Fire Subscriber, 8 Zone with Multiple Communication Technologies (MCT), Red Enclosure</i>
<b>7707P-88-ULP-M</b>	<i>IntelliNet 2.0 Fire Subscriber, 8 Zone with 7794A AES-IntelliPro, and integrated onboard Local Annunciator plus MCT, Red Enclosure</i>
7707P-44-M	<i>IntelliNet 2.0 Fire Subscriber, 4x4 Zone (4 Reversing Polarity, 4 Supervised) with Multiple Communication Technologies (MCT), Red Enclosure</i>
7707P-44-ULP-M	<i>IntelliNet 2.0 Fire Subscriber, 4x4 Zone (4 Reversing Polarity, 4 Supervised) with 7794A AES-IntelliPro, and integrated onboard Local Annunciator plus MCT, Red Enclosure</i>
<b>2.0 ACCESSORIES</b>	
7794A	Standalone AES-IntelliPro Fire full data module add-on accessory board with firmware for new <i>IntelliNet 2.0</i> units only, cannot be used in legacy units
77-WiFi	AES certified WiFi adapter
77-FACPA	FACP Power Supply Adapter for internal mount
77-FACPA-KIT	External installation hardware for 2-way Junction Box
<b>Legacy Fire Subscribers</b>	
7706-ULF	Integrated Fire Monitoring System, Red Enclosure
7788F-ULP-P	Legacy Fire Subscriber, 8 Zone with 7795 AES-IntelliPro (7794 full data module, 7762 hardware supervisory module, and 7740 Local Annunciator), Red Enclosure
7788F-ULP	Legacy Fire Subscriber, 8 Zone, 8 Supervised Zones with 7794 AES-IntelliPro, Red Enclosure
7788F	Legacy Fire Subscriber, 8 Zone, 8 Supervised Zones, Red Enclosure
7744F-ULP-P	Legacy Fire Subscriber, 4 Zone with 7795 AES-IntelliPro (7794 full data module, 7762 hardware supervisory module, and 7740 Local Annunciator), Red Enclosure
7744F-ULP	Legacy Fire Subscriber, 4x4 Zone, 4 Supervised Zones with 7794 AES-IntelliPro, Red Enclosure
7744F	Legacy Fire Subscriber, 4x4 Zone, 4 Reversing Polarity, 4 Supervised Zones, Red Enclosure
<b>LEGACY ACCESSORIES</b>	
7794	Standalone AES-IntelliPro Fire full data module add-on accessory board for legacy units only, please see 7794A above for <i>IntelliNet 2.0</i> version

## Technical Specifications

## 7707 Fire

### DIMENSIONS

13"H x 8.5"W x 4.5"D  
(33cmH x 21.5cmW x 11.4cmD)

### WEIGHT

5.8 lbs (2.6 kilograms)  
excluding battery  
13 lbs (5.9 kilograms) with  
10 Ah battery

### RADIO FREQUENCY

Standard Frequency Range:  
450-470 MHz  
Contact AES for other UHF  
and VHF frequencies

### ANTENNA

2.5 dB tamper resistant antenna  
included, mounts on enclosure  
Optional remote mounting  
antenna available

### POWER INPUT

AC SOURCES  
Transformer: Class 2  
16.5V AC nominal output  
1.9 A max current (40 VA MIN)  
ELK ELK-TRG1640,  
MG ELECTRONIC SALES MGT1640,  
or AES 1640 (not included)  
DC SOURCES (includes FACP)  
24V DC Regulated Power Supply  
with Subscriber  
Rechargeable Battery  
1.9 A max current

### BACKUP BATTERY

10-12 Ah, UL recognized lead acid  
gel cell, size based on subscriber  
configuration

### ALARM SIGNAL INPUTS/ZONES

- 8 individually programmable  
E.O.L. type zone inputs
- 4+4: 4 reverse polarity input and  
4 individually programmable  
E.O.L. type zone inputs
- Optional 7794A AES-*IntelliPro* for  
full data via Contact ID, Pulse,  
and Modem IIe

### UL LISTINGS

UL 864 10<sup>th</sup> Edition  
Standard for Control Units and  
Accessories for Fire Alarm Systems  
ULC S559-04 1<sup>st</sup> Edition  
Equipment for Fire Signal  
Receiving Centres and Systems

### TROUBLE OUTPUT—ACK DELAY/ANTENNA CUT

Form C relay, fail secure, rated 24V  
DC 1A resistive, unsupervised

### RESET BUTTON

Located on main circuit board

### OPERATING TEMPERATURE

32 to 120°F (0 to 49°C)

### STORAGE TEMPERATURE

14 to 140°F (-10 to 60°C)

### RELATIVE HUMIDITY

0 to 93%, non-condensing

### RECHARGE CAPABILITY

Will charge 12V battery size  
from 10-12 Ah

### PORTS

Ethernet for configuration  
and message communication  
USB access for software upgrade

### REMOTE ANNUNCIATOR

AES Model 7740  
Remote Annunciator, supervised

### COMPATIBLE RECEIVERS

7705i AES-MultiNet Receiver

### CONFIGURATION INTERFACE

Web browser capable device  
accessible via smartphone, tablet,  
laptop, or PC

### CURRENT CONSUMPTION

Standby w/ charged backup battery:  
200 mA (1.2 A Transmitting)  
Standby + charging backup battery:  
900 mA (1.9 A Transmitting - MAX)

### POWER OUTPUT

2 or 5 Watts  
Factory set

### ENCLOSURE MATERIAL

Steel with paint finish

### FINISH COLOR

Red

### VISUAL INDICATORS

Front panel LCD  
(2 x 20 alphanumeric character  
backlit display)  
Power and Trouble LEDs  
(ALM, Trouble, Tx, Rx, WA)

## Contact Us

For pricing and availability or to learn more about *IntelliNet* 2.0, please call your local  
AES Sales Representative at (800) 237-6387 or email [sales@aes-corp.com](mailto:sales@aes-corp.com).



[www.aes-corp.com](http://www.aes-corp.com)

AES Corporation | 285 Newbury Street | Peabody, MA 01960 United States

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Press the **MENU** button to view the next message.

#### 7794A IntelliPro Software Version

If a 7794A IntelliPro is installed in the Subscriber, the software version will appear as shown below, where X.XXX is the version number:

Panel Interface:  
7794A Ver X.XXX

When no 7794A is present, the display will show **None** as shown below:

Panel Interface:  
None

Press the **MENU** button to return to the home screen, which is the System Status Display.

#### 8.16 Off-Normal Operation

Faults and alarms that cause off-normal operation are shown with fault messages in the LCD display. See table below for more information.

Table 6. Faults and Alarms with Off-Normal Operation	
Off-Normal Condition Fault Message	Problem
AC POWER FAIL	AC power to Subscriber disconnected or below minimum voltage
DC POWER FAIL	DC power to Subscriber disconnected or below minimum voltage
CHARGER	Battery charger failure
NETCON	Subscriber NetCon value below minimum required
GROUND FAIL	Resistance to earth ground below limit on zone input
AP IFACE FAIL	7794A IntelliPro card failure
RF COMM FAIL	Failure to communicate with another unit on mesh network
ANNUNC FAIL	7740 Remote Annunciator failure
BATTERY FAIL	Backup battery voltage below minimum
Alarm/Trouble Messages	
ZONE 2 ALARM	Example of Alarm condition; Zone 2 input
ZONE 7 TRBL	Example of Trouble condition; Zone 7 input

#### Fault Display

Faults are shown on the LCD display on the enclosure. The following behavior occurs depending on whether single or multiple fault conditions exist.

- **Single fault** – A single fault condition is shown on the display, and the Subscriber buzzer sounds as shown below:

7707      VER:X.XXXX  
Status: AC FAIL





**Out of the box:**

- 7707 Fire Subscriber
- Quick Start Guide - Part# 40-7707-QSG
- Zone Input Card
- 7794A IntelliPro – (if equipped)

**Overview:** The 7707 Fire Subscriber Unit is an AES-IntelliNet 2.0 RF Communicator used to link an alarm panel to an alarm monitoring central station. The unit is UL/ULC Listed and NFPA compliant for commercial fire alarm monitoring. Plug-in zone input cards provide 8 wired inputs that are end of line resistor (EOL) type or 4 EOL and 4 Reverse Polarity inputs for connection to fire control panel relays. The system is designed for use with the AES-IntelliNet system for alarm, supervisory, and trouble messages to be transmitted to the system central receiver.

### 7707 Subscriber Unit Installation, Configuration and Programming:

See these resources for detailed information about installing, configuring, and programming the 7707:

- *AES 7707 RF Subscriber Installation, Operation & Programming Manual* (Part# 40-7707)
- *AES 7711 and AES 7712 Zone Input Card Installation Manual* (7711 = Part# 40-7711, 7712 = Part# 40-7712)
- *AES 7794A IntelliPro Installation, Operation & Programming Manual* (Part# 40-7794A)

**Important!** The AES 7041E Hand Held Programmer cannot program the 7707 subscriber.

- 1) Connect to 7707:** A web browser enabled device using an Ethernet or Wi-Fi connection must be used to configure the 7707.
  - 1. Ethernet Connection:** Connect an Ethernet cable to the 7707 and the other end directly into a PC/Laptop or router. Enter the IP address displayed on the 7707 LCD on the web browser of your PC/Laptop and log in with credentials admin/admin for username/password.
  - 2. Wi-Fi Connection:** Plug in an approved Wi-Fi module into one of the 7707 USB ports. On your Wi-Fi device connect to SSID "AES2.0-XXX" using password "7707fire" where XXX are the last 3 digits of the serial number of the 7707. The Captive Portal will automatically redirect to the web browser login screen where you can log in with credentials admin/admin for username/password. Alternatively you can also enter the IP address displayed on the 7707 LCD on the web browser of Wi-Fi smartphone or tablet.
- 2) Set ID and Cipher Code:**
  1. In the **Subscriber ID** panel, enter the **Subscriber ID**.
  2. In the **Radio Configuration** panel, enter the **Cipher Code**.  
**Note:** You will need to have the system cipher code for the subscriber to enroll in the network. The Subscriber ID must be unique from any other subscriber on the network.

**3) Set Zone Inputs:**

1. Select the **Accessories** tab, and then under the **Zones** panel set the input types. For fire input, set **Fire Zones** to **Yes**. To allow reporting, set **Consecutive AT** events to **Yes**, otherwise leave at the default, No
2. Set the zone input to either **Fire** or **Supervised**.
3. Set zone input restoral to either **YES** or **NO** for the zone.
4. Repeat Steps 1 to 5 for the remaining zone inputs used

**Important!** Set unused zone inputs to **Bypass**.

**4) Set Flexible Power Option:**

1. Select the **Configuration** tab, then under the **Flexible Power Option** panel set the **Power From** type that matches the power source used for the subscriber.
2. If done, click **Save Changes**.

**5) Disconnect from 7707**

After configuring the 7707 remove the Ethernet cable or the Wi-Fi module from the 7707.

**Reset to Default Configuration:**

The subscriber and (if installed) the 7794A IntelliPro can be reset. To reset subscriber to default (factory) configuration:

1. Select the **System** tab, and then under the **Reset to Default Configuration** panel select the **Subscriber Config** control. Set to **Yes**.
2. Click **Reset Configuration**.  
 To reset the 7794A IntelliPro to default (factory) configuration:
  1. Select the **System** tab, and then under the **Reset to Default Configuration** panel select the **IntelliPro Config** control. Set to **Yes**.
  2. Click **Reset Configuration**.

**LIMITED PRODUCT WARRANTY:**

AES warrants to the original purchaser that the AES Subscriber Unit will be free from defects in material and workmanship under normal use and service for three (3) years from the date of original purchaser's purchase. Except as required by law, this Limited Warranty is only made to the original purchaser and may not be transferred to any third party.

This Limited Product Warranty is made in lieu of any other warranties, expressed or implied, it being understood that all other warranties, expressed or implied, including of merchantability or fitness for a particular purpose, are hereby expressly excluded.

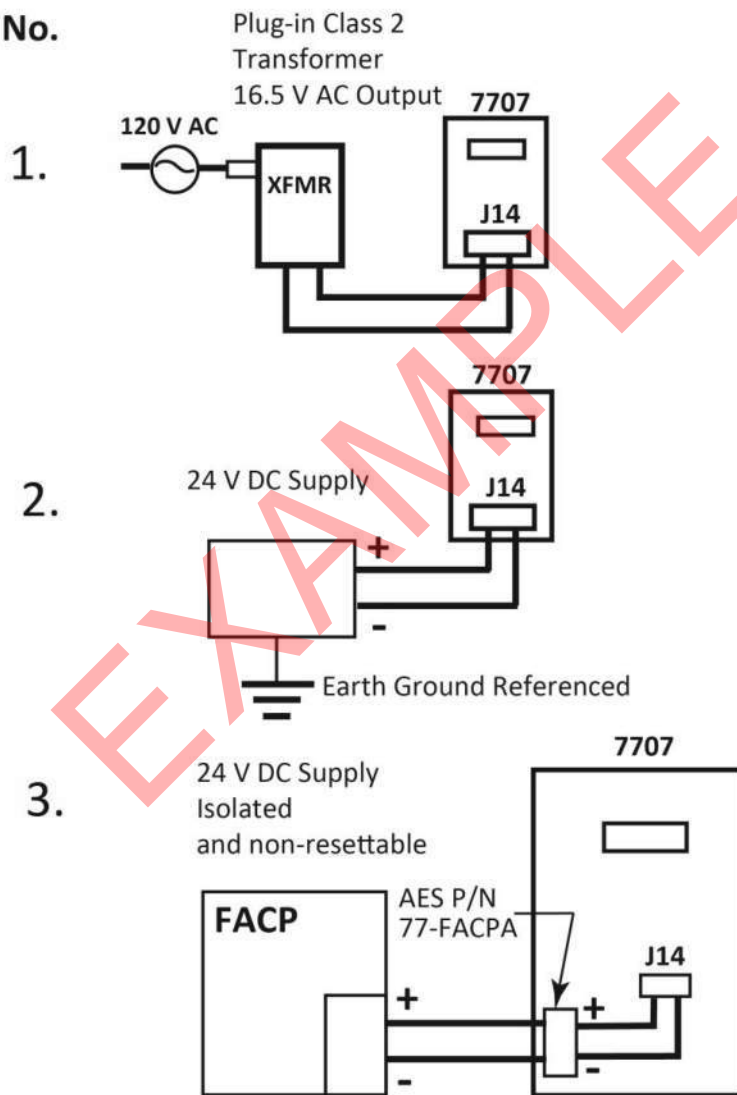
AES assumes no liability for any personal injury, property damage, consequential damages, or any other loss or damage due, among other things, to this product's failure to operate or provide adequate warning. AES's sole responsibility is to repair or replace, at AES's sole option, the AES product that is judged defective by AES during the limited warranty period under the terms of its Limited Warranty.

**SEE REVERSE SIDE FOR POWER OPTION DIAGRAMS**



**POWER  
OPTION**

For details refer to Model 7707 Install Manual 40-7707

**No.**

D77076070102

## Full Data Module

# 7794A AES-IntelliPro™ Fire for 2.0

### Technical Specifications

- Transmits full data to AES receiver using Contact ID or Pulse formats
- Formats Supported: Contact ID, Pulse 3+1, Pulse 4+1, Pulse 4+2

### DIMENSIONS

2.8 in x 5.0 in (7.1 cm x 12.7 cm)

### WEIGHT

0.2 lb (0.09 kg)

### I/O CONNECTIONS

- AES subscriber with power
- POTS incoming phone line
- Phone output from alarm panel
- Trouble output (form C relay)

### POWER REQUIREMENTS

12 VDC nominal, primary and backup power provided by the AES RF Transceiver Unit

### HOW TO ORDER

#### Models & Descriptions:

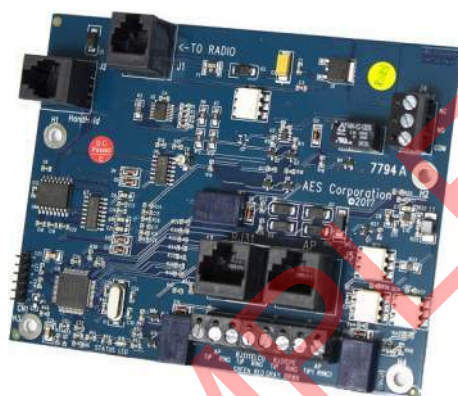
**7794A** - AES-IntelliPro Fire for 2.0

**7707P-88-ULP** - 8 Zone Fire Subscriber with AES-IntelliPro & integrated onboard Local Annunciator

**7707P-88-ULP-M** - 8 Zone Fire Subscriber with AES-IntelliPro & Multiple Communication Technologies (MCT)

**7707P-44-ULP** - 4 Zone Fire Subscriber with AES-IntelliPro & integrated onboard Local Annunciator

**7707P-44-ULP-M** - 4 Zone Fire Subscriber with AES-IntelliPro & MCT



## Features

- Commercial fire alarm applications with or without phone lines
- Transmits full alarm data from any Contact ID or Pulse format fire alarm panel
- Primary or back-up communications
- Universal wireless alarm transmitter supports most manufacturers' panels
- Easy to install in IntelliNet 2.0 Fire subscriber
- Easy to program using smartphone, tablet, or PC
- Option to monitor telephone lines
- Transmits full data to AES receiver using Contact ID or Pulse formats
- Formats Supported: Contact ID, Pulse 3+1, Pulse 4+1, Pulse 4+2

The 7794A AES-IntelliPro Fire is an add-on module for IntelliNet 2.0 subscribers that enables transmission of full alarm zone data from an alarm panel to a central station over an established AES mesh radio network.

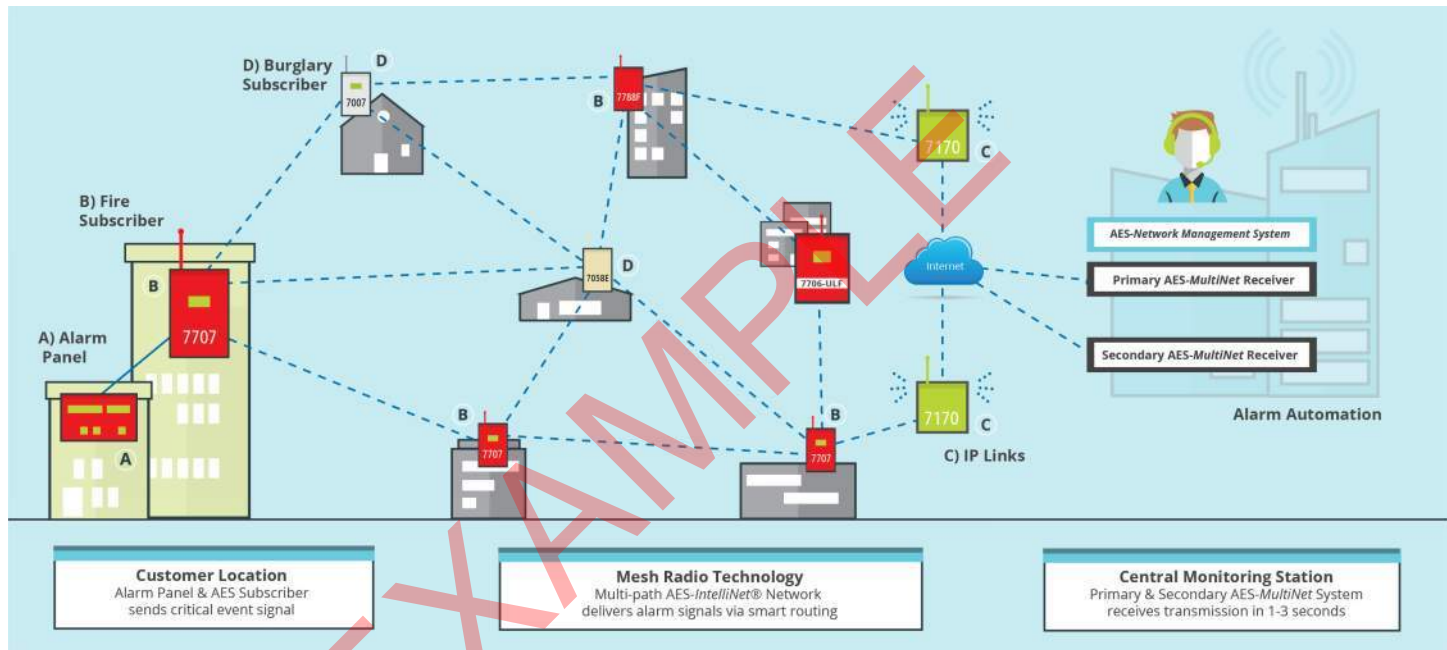
AES subscribers with AES-IntelliPro Fire can operate in applications with or without a phone line providing full emulation of the phone line for the alarm panel communicator. AES-IntelliPro Fire supports most popular alarm communication protocols including Contact ID and Pulse.

## Easy Installation

AES-*IntelliPro* Fire easily installs in the *IntelliNet* 2.0 subscriber housing and is powered from the transceiver module, requiring no additional power connections. 2.0 Fire subscribers can be ordered with AES-*IntelliPro* installed. AES-*IntelliPro* Fire is easy to program using a smartphone, tablet, or PC.



## Private Wireless Mesh Network



## About AES Corporation

Established in 1974, AES Corporation empowers companies to grow profitable alarm monitoring businesses, and government agencies to enhance security anywhere in the world. By providing the industry's only patented operator-owned and controlled private wireless mesh networks, AES ensures superior reliability, low TCO and optimal RMR while reducing dependence on service provider infrastructures. The company's flagship AES-*IntelliNet* systems are deployed in over a half million locations worldwide.

For more information, go to [www.aes-corp.com](http://www.aes-corp.com) or call  
(800) 237-6387 or contact us at [sales@aes-corp.com](mailto:sales@aes-corp.com)

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*Quickly validate locations for AES-IntelliNet® installations*

## AES Network Connectivity Tool

### TECHNICAL

#### SPECIFICATIONS

The NCT kit includes a battery charger, car charger adapter, antenna, TNC-N adapter and carrying pouch, and can be ordered in a 2 or 5 watt configuration.

#### SIZE

Weighs just over 2 lbs.  
9.5" H x 7.5" W x 2.0" D (excluding antenna or external connectors)

#### SMART-CHARGER DEVICE FOR NCT

- US power standard 110-125 VAC, 60 Hz
- Universal power standard 100-240 VAC, 50-60 Hz

#### ENVIRONMENTAL SPECIFICATIONS

- Operating temperature range: 0° to 50° C (32° to 122° F)
- Storage temperature range: -10° – 60° C (14° to 140° F)
- Relative humidity range: 0 – 85% RHC (non-condensing)

#### HOW TO ORDER

Model	Description
7245	Network Connectivity Tool



### Features

- Easy to use one-button operation
- Response time less than 30 seconds
- Self-contained Li-ion battery and universal voltage charger
- Can typically run for 3 to 4 days of continuous use without recharging
- Auto-shutoff after 10 minutes of continuous use
- Small, easy-to-carry form factor
- RF performance equal to standard AES subscriber unit
- Removable 2.5 dBi "rubber duck" style antenna
- Integrated RJ11 connectivity for configuring cipher codes and account numbers
- Small, easy-to-carry form factor

*"The more we can expand our AES footprint, the better it is for our business. With the NCT, we can quickly map suitable locations for AES-IntelliNet units. Not only is NCT extremely easy for sales staff and technicians to use, it cuts the time required to evaluate each subscriber unit location by at least 30 minutes."*

Dealers and installers rely on AES-IntelliNet fire and burglary alarm monitoring products to deliver superior reliability, high RMR and low total cost of ownership. Now, with the AES Network Connectivity Tool (NCT), you can drive TCO even lower while accelerating installation of subscriber units.

## About AES Corporation

Established in 1974, AES Corporation empowers companies to grow profitable alarm monitoring businesses, and government agencies to enhance security anywhere in the world. By providing the industry's only patented operator-owned and controlled private wireless mesh networks, AES ensures superior reliability, low TCO and optimal RMR while reducing dependence on service provider infrastructures. The company's flagship AES-*IntelliNet* systems are deployed in over a half million locations worldwide.

## Obtain Viability Results in Seconds

The NCT makes it easier for you to sell and install AES-*IntelliNet* into new or existing AES-based wireless mesh networks. Instead of having to pull actual subscriber units from stock to test field locations for network connectivity, your field sales personnel and technicians can use the NCT to evaluate viability in less than 30 seconds.

## Boost Productivity

With the NCT, you reduce the time personnel must spend on-premises evaluating locations. High-volume businesses significantly cut labor costs associated with installations and free up personnel to handle more customers in a given day.

## Ease Operations

The NCT is remarkably simple to use and convenient to carry. The one-button-operation tool weighs just two pounds, fits in the palm of the hand and typically runs for days without recharging. Its bright NetCon number display and path count indicator LEDs ensure users can read results under any lighting conditions.





# AES 1640-ENCL Enclosure



**Cover Open**



**Cover Closed**

## Installation Manual

### Table of Contents

1. Product Description: .....	2
2. Safety Considerations: .....	2
3. Technical Specifications: .....	3
4. Installation Instructions: .....	3
5 Warranty / Service Procedures: .....	4

## 1. Product Description:

The 1640-ENCL is an inclosure intended to house and protect the AES 1640 or Amseco XF-1640 Transformer when used in a UL installation. It is designed to be installed over the receptacle replacing a standard wall plate. The enclosure is to be secured to the wall using the 4 mounting holes. Conduit is to be routed between this enclosure and the enclosure of the device it is providing power.

The following diagram is of the key components in a 7170 installation including the typical use of the 1640-ENCL Enclosure.

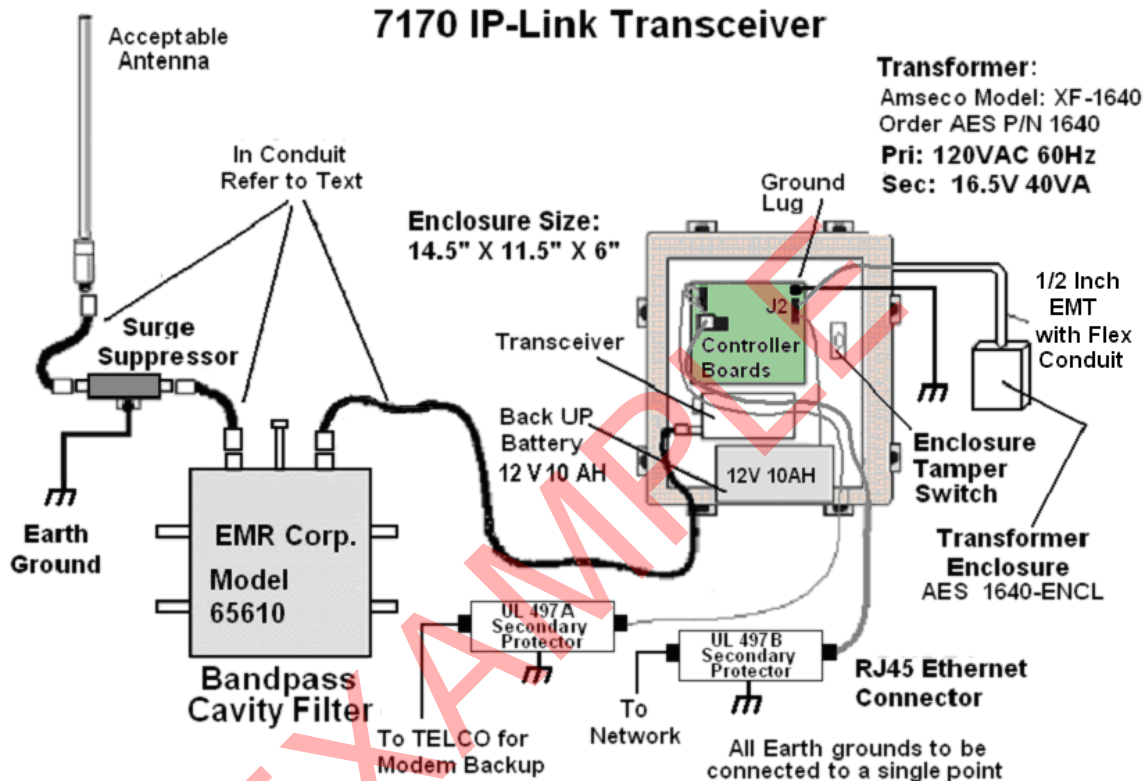


Figure A. Typical Installation of a 1640-ENCL

## 2. Safety Considerations:

The following items are safety related precautions that you should take into consideration when installing your AES IntelliNet system. They are for your safety as well as others and the safety of your equipment.

- For US installations, all equipment and wiring must be installed in accordance with National Electric Code, applicable UL Standards and local building codes.
- For Canadian installations, all equipment and wiring must be installed in accordance with Canadian Electric Code, applicable ULC Standards and local building codes.
- Be certain to properly ground the Enclosure per applicable N.E.C or C.E.C. Grounding of equipment is for your safety and the safety of your equipment and should not be neglected. The screws used to secure the receptacle are not adequate to provide a proper ground. Use separate grounding method to ensure the enclosure is properly grounded.

### 3. Technical Specifications:

Listed below are the technical specifications for the 1640-ENCL Enclosure.

- Painted 16 Ga. steel enclosure
- Weight Approx. 2 Pounds

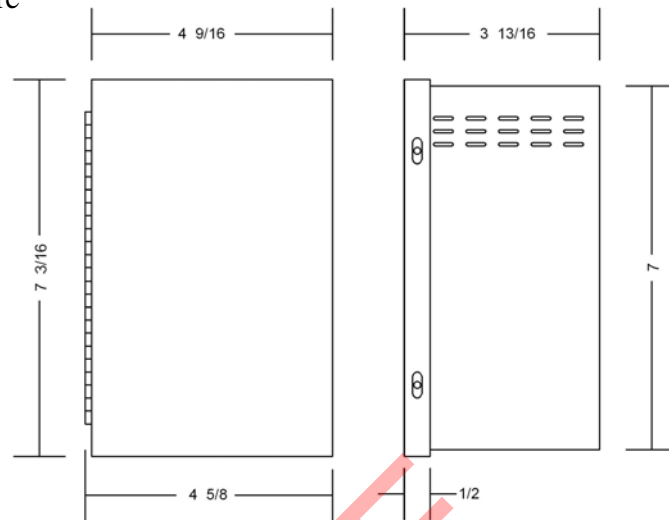


Figure B—  
Enclosure Dimensions

### 4. Installation Instructions:

1. Use a branch circuit that is dedicated for alarm use and not a switched receptacle.
2. Turn off power to the receptacle at the service disconnect (breaker).
3. Remove any existing wall plate.
4. Place the AES 1640-ENCL over the receptacle and mark the four corner mounting holes.
5. Affix appropriate wall mounting hardware (i.e.: molleys etc) if needed.
6. Remove duplex receptacle mounting screws.
7. Position the 1640-ENCL over the receptacle and re-install the duplex receptacle mounting screws. Do not tighten at this time.
8. Verify proper alignment of receptacle and enclosure with wall mounting holes and secure enclosure to the wall.
9. Tighten receptacle-mounting screws.
10. Connect conduit to the 1640-ENCL using the appropriate knockout. Use Flex Conduit in the installation of the 1640-ENCL to enable easier servicing of the receptacle and produce less strain on the Enclosure.
11. Route wires through the conduit and secure to transformer.
12. Secure transformer to receptacle using the tab/screw.
13. Secure 1640-ENCL cover with screws.
14. Confirm or connect wires to the device that this transformer is powering.
15. Restore power to receptacle.



## 5 Warranty / Service Procedures:

### OWNER WARRANTY - AES CORPORATION LIMITED PRODUCT WARRANTY AND TECHNOLOGY LICENSE

#### LIMITED PRODUCT WARRANTY:

AES Corporation ("AES") warrants to the original purchaser that each AES Subscriber Product will be free from defects in material and workmanship for three (3) years from date of purchase and all other products purchased from AES including central station receivers and accessories will be warranted for one (1) year from the date of purchase. At no cost to the original purchaser for parts or labor, AES will repair or replace any AES Product or any, part or parts thereof which are judged defective under the terms of this Warranty.

Defective AES Products must be returned to AES directly, provided they are properly packed, postage prepaid. Or exchange may be made through any authorized direct factory representative for any AES Products that are judged defective under the terms of this Warranty. Improper or incorrectly performed maintenance or repair voids this Warranty. This Warranty does not cover replacement parts that are not approved by AES. This Warranty does not apply to any AES Product or any part thereof that has been altered in any way to affect its stability or reliability, or that has been subjected to abuse, misuse, negligence, accident or act of God, or that has had the serial number effaced or removed.

Certain AES Products are designed to operate and communicate with other specified AES Products and certain other specified products, systems or networks authorized or approved by AES, as identified in the applicable AES Product instructions. This Warranty does not apply to any AES Product that is used with any unauthorized or unapproved products, systems or networks, or that has been installed, applied or used in any manner, other than in strict accordance with AES instructions.

*AES makes no warranty, express or implied, other than what is expressly stated in this Warranty.* If the law of your state provides that an implied warranty of merchantability, or an implied warranty of fitness for particular purpose, or any other implied warranty, applies to AES, then any such implied warranty is limited to the duration of this Warranty.

AES cannot be aware of and is not responsible for the differing values of any property to be protected by its alarm reporting systems. This Warranty does not cover and AES shall not be liable for any defect, incidental or consequential, loss or damage arising out of the failure of any AES Product to operate.

Some states do not allow the exclusion or limitation of the durations of implied warranties or the limitation on incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This Warranty gives you specific legal rights and you may also have other rights that vary from state to state.

#### TECHNOLOGY LICENSE:

Certain AES Products include software, protocols and other proprietary and confidential technology and trade secrets of AES which are incorporated in or provided with AES Products solely for use in conjunction with and in order to operate AES Products ("Licensed Technology"). AES grants the original purchaser a non-exclusive license to use such Licensed Technology solely in connection with the use and operation of AES Products and for no other purpose or use whatsoever. No title or ownership in or to any such Licensed Technology is conveyed by the sale or delivery of any AES Products; all such rights are retained by AES.

**AES SERVICE PROCEDURE:** Contact AES by Phone (978) 535-7310, Fax (978) 535-7313 or Email [service@aes-intellinet.com](mailto:service@aes-intellinet.com), to receive a Return Material Authorization Number. Have the AES part number and serial number ready. Repack equipment in original or equivalent packaging. Inside the box, please include a contact name, telephone number, address and a brief description of the reason for return.

Ship items freight-prepaid to:

Repair Services, RMA# \_\_\_\_\_  
AES Corporation,  
285 Newbury Street  
Peabody, MA 01960 USA

(Contact AES for Return Material Authorization number)

June 2007

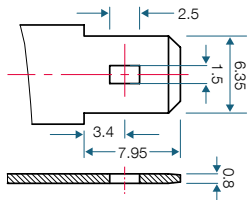


## PS-12120 12V 12.0 AH @ 20-hr. 12V 11.0 AH @ 10-hr.

Rechargeable Sealed Lead Acid Battery  
PS – General Purpose Series

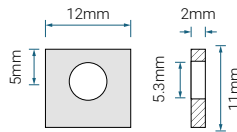
### TERMINALS: (mm)

**F2:** Quick disconnect tabs,  
0.250" x 0.032" – Mate with  
AMP. INC FASTON "250" series



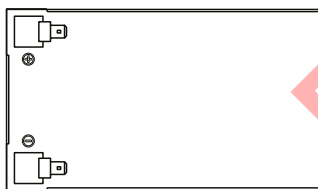
Torque – Not Applicable

**NB:** Tin plated brass post with  
'Nut & Bolt' fasteners



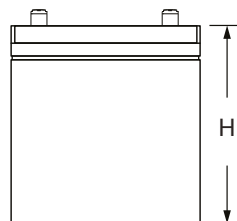
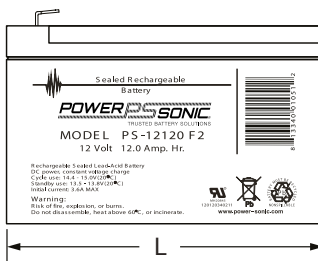
Torque: 2.0~3.0 Nxm

### DIMENSIONS: inch (mm)



**F2:**  
L: 5.94 (151) W: 3.86 (98)  
H: 3.66 (93) HT: 3.86 (98)

**NB:**  
L: 5.94 (151) W: 3.86 (98)  
H: 3.66 (93) HT: 4.09 (104)



Tolerances are +/- 0.04 in. (+/- 1mm) and +/- 0.08 in. (+/- 2mm) for height dimensions.  
All data subject to change without notice.

### CORPORATE HEADQUARTERS (USA AND INTERNATIONAL EXCLUDING EMEA)

**Power-Sonic Corporation**  
7550 Panasonic Way, San Diego,  
California 92154  
T: +1 (619) 661 2020  
F: +1 (619) 661 3650  
E: customer-service@power-sonic.com

### POWER-SONIC EUROPE LIMITED (EMEA – EUROPE, MIDDLE EAST AND AFRICA)

3 Buckingham Square,  
Hurricane Way, Wickford,  
Essex SS11 8YQ  
T: +44 (0)1268 560686  
F: +44 (0)1268 560902  
E: salesEMEA@power-sonic.com

## FEATURES

- Absorbent Glass Mat (AGM) technology for superior performance
- Valve regulated, maintenance free spill proof construction
- Power/volume ratio yielding excellent energy density
- Rugged vibration and impact resistant ABS case and cover
- Gas recombination technology
- 5 year design life

## APPROVALS

- Approved for transport by air. D.O.T., I.A.T.A., F.A.A. and C.A.B. certified
- U.L. recognized
- ISO9001:2015 – Quality management systems

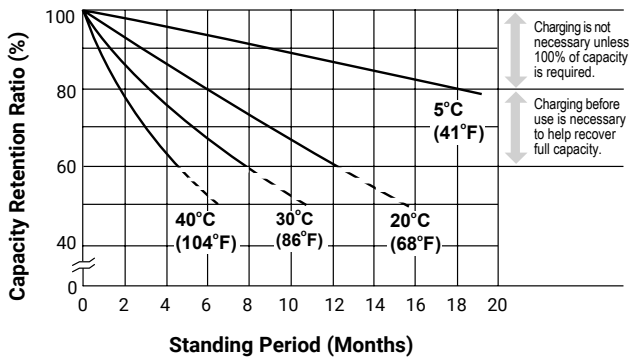
## PERFORMANCE SPECIFICATIONS

<b>Nominal Voltage</b>	12 volts (6 cells)
<b>Nominal Capacity</b>	
20-hr. (600mA to 10.50 volts)	12.00 AH
10-hr. (1.10A to 10.50 volts)	11.00 AH
5-hr. (2.10A to 10.20 volts)	10.50 AH
1-hr. (7.25A to 9.00 volts)	7.25 AH
<b>Approximate Weight</b>	7.92 lbs. (3.59 kg)
<b>Internal Resistance (approx.)</b>	20.0 milliohms
<b>Max Short-Duration Discharge Current (10 Sec.)</b>	120.0 amperes
<b>Shelf Life (% of nominal capacity at 68°F (20°C))</b>	
1 Month	97%
3 Month	91%
6 Month	83%
<b>Operating Temperature Range</b>	
Charge	5°F (-15°C) to 122°F (50°C)
Discharge	-4°F (-20°C) to 140°F (60°C)
<b>Case</b>	ABS Plastic
<b>Power Sonic Chargers</b>	PSC-122000A-C PSC-122000-PC

## PS-12120 12V 12.0 AH @ 20-hr. 12V 11.0 AH @ 10-hr.

Rechargeable Sealed Lead Acid Battery  
PS – General Purpose Series

### SHELF LIFE & STORAGE



### CHARGING

**Cycle Applications:** Apply constant voltage charge at 2.35v/c – 2.45v/c (14.1 – 14.7v for 12v Monobloc) at 20°C. Initial charging current should be set at less than 0.25C Amps. Switch to float charge to avoid overcharging.

**"Float" or "Stand-By" Service:** Apply constant voltage charge of 2.25v/c – 2.30v/c (13.5 to 13.8 volts for 12v Monobloc at 20°C. When held at this voltage, the battery will seek its own current level and maintain itself in a fully charged condition.

**Temperature Compensation:** Charging Voltage for both Cyclic and Standby applications should be regulated in relation to ambient temperature. As temperature rises charging voltage should be reduced to prevent overcharge and increased as temperature falls to avoid undercharge.

For further charging information including temperature compensation factors, see Power Sonic Technical Manual/ Power Sonic Charger specifications.

### APPLICATIONS

- General purpose
- Medical
- Emergency lighting
- Fire and security

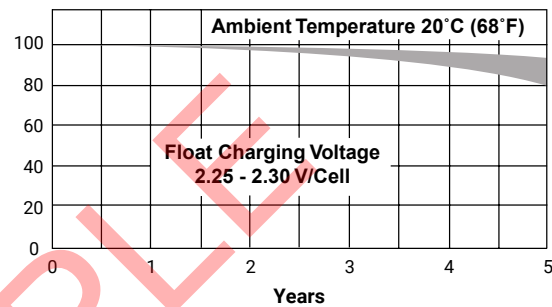
#### CORPORATE HEADQUARTERS (USA AND INTERNATIONAL EXCLUDING EMEA)

**Power-Sonic Corporation**  
7550 Panasonic Way, San Diego,  
California 92154  
T: +1 (619) 661 2020  
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#### POWER-SONIC EUROPE LIMITED (EMEA – EUROPE, MIDDLE EAST AND AFRICA)

3 Buckingham Square,  
Hurricane Way, Wickford,  
Essex SS11 8YQ  
T: +44 (0)1268 560686  
F: +44 (0)1268 560902  
E: salesEMEA@power-sonic.com

### LIFE CHARACTERISTICS IN STAND-BY USE



### CHARGERS

Power Sonic offers a wide range of chargers suitable for batteries with a variety of capacities.

Please refer to our website for more information on our switch mode and transformer type chargers.

Please contact our technical department for advice if you have difficulty in locating a suitable charger.

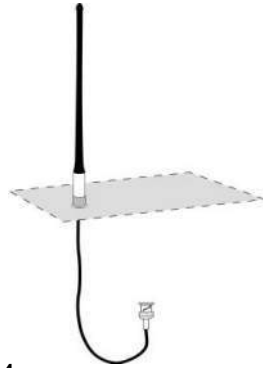
### FURTHER INFORMATION

Please refer to our website [www.power-sonic.com](http://www.power-sonic.com) for a complete range of useful downloads, such as product catalogs, material safety data sheets (MSDS), ISO certification, etc.



# ANTENNA & ACCESSORY GUIDE

Select antennas available  
in lower frequencies.  
Please call for  
detailed information.



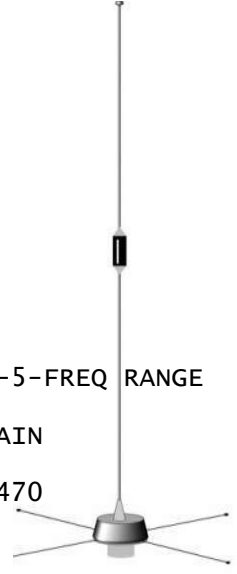
PART NUMBER	7214
DESCRIPTION	RUBBER DUCK
FREQUENCY RANGES	400-500
GAIN	2.5 dB
POWER CAPABILITY	5 watt
MAST/WHIP LENGTH	11.5"
MAST/WHIP MATERIAL	BLACK VINYL CLAD
MOUNT STYLE	MOUNTS ON CASE
GROUND RADIALS INCLUDED	NO, CASE IS GROUND PLANE
CONNECTOR TYPE	TNC
RECOMMENDED CABLE	CABLE INCLUDED
APPLICATION	INDOOR
BANDWIDTH	+/- 5MHZ
VERTICAL BEAM WIDTH	38 DEGREE
HORIZONTAL BEAM WDTH	OMNIDIRECTIONAL



7210-3-FREQ RANGE
STANDARD 3 dB
450-470
2.5 dB
50 watt
14"
STAINLESS STEEL
UNIVERSAL MOUNT
YES
N
10 OR 25'
INDOOR/OUTDOOR
+/- 5MHZ
35 DEGREE
OMNIDIRECTIONAL



7211-FREQ RANGE
STEALTH
450-470
3 dB
50 watt
24"
VINYL CLAD
EASY HANG MOUNT
YES
TNC
10' CABLE INCL
INDOOR
+/- 5MHZ
35 DEGREE
OMNIDIRECTIONAL



7210-5-FREQ RANGE
HI GAIN
450-470
5 dB
50 watt
28.5"
STAINLESS STEEL
UNIVERSAL MOUNT
YES
N
10 OR 25'
INDOOR/OUTDOOR
+/- 5MHZ
18 DEGREE
OMNIDIRECTIONAL

# ANTENNA & ACCESSORY GUIDE

Select antennas available  
in lower frequencies.  
Please call for  
detailed information.

PART NUMBER	7210-6-FREQ RANGE	7210-7-FREQ RANGE	7210-9-FREQ RANGE
DESCRIPTION	RUGGED HI GAIN	HIGHER GAIN	CENTRAL STATION
FREQUENCY RANGES	450-470	460-470	450-470
GAIN	6 dB	7+ dB	9 dB
POWER CAPABILITY	150 watt	200 watt	200 watt
MAST/WHIP LENGTH	45.5"	60"	115"
MAST/WHIP MATERIAL	FIBERGLASS	FIBERGLASS	FIBERGLASS
MOUNT STYLE	MAST MOUNT	MAST MOUNT	MAST MOUNT
GROUND RADIALS INCLUDED	YES	YES	YES
CONNECTOR TYPE	N	N	N
RECOMMENDED CABLE	10 OR 25'	10 OR 25'	10 OR 25'
APPLICATION	INDOOR/OUTDOOR	INDOOR/OUTDOOR	INDOOR/OUTDOOR
BANDWIDTH	+/- 5MHZ	+/- 5MHZ	+/- 5MHZ
VERTICAL BEAM WIDTH	14 DEGREE	12 DEGREE	7 DEGREE
HORIZONTAL BEAM WDTH	OMNIDIRECTIONAL	OMNIDIRECTIONAL	OMNIDIRECTIONAL



## 10' Cable

RG58 Low Loss  
BNC male to N male  
PN 7220-10-N

## 25' Cable

RG58 Low Loss  
BNC male to N male  
PN 7220-25-N

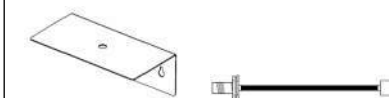
## Lightning Protector

N female to N female  
Coax Inline  
A MUST for systems with  
outdoor antennas  
PN 7230



## External Antenna Mounting Kit

1 Antenna Mounting Bracket  
1 TNC male inline  
1 TNC female bulkhead  
6' RG58 coax cable  
PN 7214-EMK



### 6.5 Antenna and Surge Suppressor Grounding

A protective surge suppressor (AES Model 7230) must be installed in line with any type of remotely installed antenna outside a building as shown in the diagram below. The surge suppressor and remote antenna must be earth-grounded. For U.S. installation, check National Electrical Code (NEC), state, or local electrical code requirements. For Canadian installations, check Canadian Electrical Code, province, or local electrical code requirements.

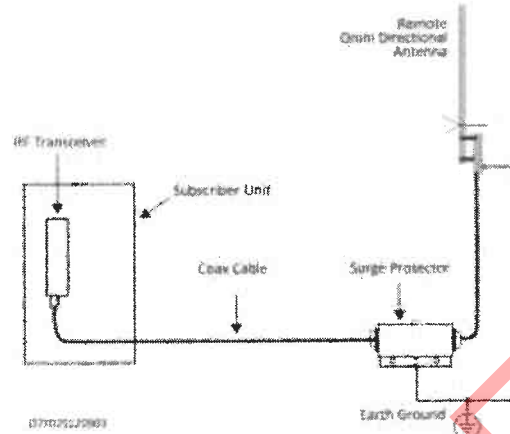


Figure 5. Antenna and Surge Suppressor Grounding

## AES-IntelliNet Installation Log

<b>Installation Date:</b>	<b>Installation Time:</b>	<b>Installation Technician:</b>
---------------------------	---------------------------	---------------------------------

**Installation Address:**

Location Name: \_\_\_\_\_

Street: \_\_\_\_\_

City, State, Zip: \_\_\_\_\_

**AES Account #:** \_\_\_\_\_ **AES Model #:** \_\_\_\_\_ **AES Serial #:** \_\_\_\_\_

**FACP Account #:** \_\_\_\_\_ **FACP Model #:** \_\_\_\_\_ **FACP Serial #:** \_\_\_\_\_

**Battery Date Code** (for batteries installed in AES Subscriber/IP Link): \_\_\_\_\_

**Pre-Install Checklist:**

- ☐ Account # and serial # recorded in internal systems
- ☐ Account # label placed on AES Subscriber
- ☐ Account # provided to Central Station

**AES Subscriber & Antenna Installation Location** (i.e. 3<sup>rd</sup> floor, west side of building, control room near elevator):

---



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**Antenna Type:**

- ☐ Rubber Duck   
 ☐ 3dB   
 ☐ 5dB   
 ☐ 6dB   
 ☐ 9dB   
 ☐ Stealth   
 ☐ Phantom
- ☐ Other

**Power Source:**

- ☐ 16.5 VAC Transformer – **NOTE: 1640-ENC is required**     
 ☐ 24 VDC from FACP – **NOTE: 77-FACPA is required**

**RF Performance:**

- ☐ Unit connected to earth ground
- ☐ Surge Protector Installed & grounded (remote antenna installs only)

NetCon Reading (subscriber only): \_\_\_\_\_

Forward Power (remote antenna installs only):

Reflected Power (remote antenna installs only):

---



---



## Fire Alarm System Secondary Battery-set Calculation Worksheet

AES Product	Standby Current (Amps)		QTY		Total Standby Current (Amps)	Alarm/Transmit Current (Amps)		QTY		Total Alarm Current (Amps)	
7170	0.3700	X	1	=	0.370	0.9000	X	1	=	0.900	
Total System Standby Current (Amps)					0.370	Total System Alarm Current (Amps)					0.900

	## Hour Standby Time ****		Standby Current (Amps)		Required Standby Capacity (Amp-Hours)	Required Alarm Time (Hours)		Alarm/Transmit Current (Amps)		Required Alarm Capacity (Amp-Hours)
	24	X	0.370	=	8.880	1	X	0.9000	=	0.900

	Required Standby Capacity (Amp-Hours)		Required Alarm Capacity (Amp-Hours)		Total Capacity (Amp-Hours)
	8.88	+	0.900	=	9.780

\*Please note, Manufacturer does not have updated calculation worksheet reflecting the 7177 part number at this time.

EXAMPLE



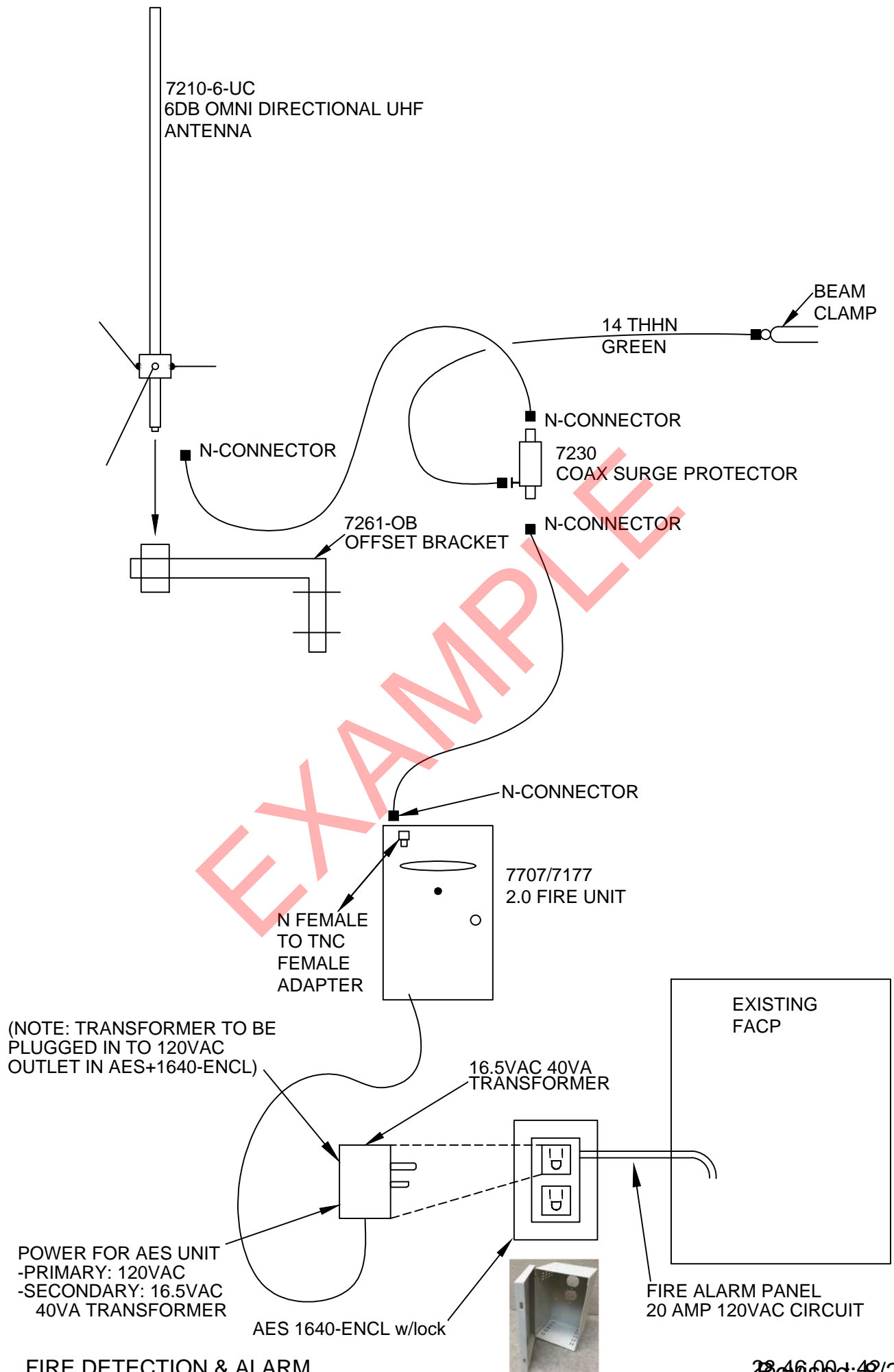
## Fire Alarm System Secondary Battery-set Calculation Worksheet

AES Product	Standby Current (Amps)		QTY		Total Standby Current (Amps)	Alarm/Transmit Current (Amps)		QTY		Total Alarm Current (Amps)	
7707P-88-ULP-M	0.4000	X	1	=	0.400	1.5500	X	1	=	1.550	
Total System Standby Current (Amps)					0.400	Total System Alarm Current (Amps)					1.550

	## Hour Standby Time ****		Standby Current (Amps)		Required Standby Capacity (Amp-Hours)	Required Alarm Time (Hours)		Alarm/Transmit Current (Amps)		Required Alarm Capacity (Amp-Hours)
	24	X	0.400	=	9.600	1	X	1.5500	=	1.550

	Required Standby Capacity (Amp-Hours)		Required Alarm Capacity (Amp-Hours)		Total Capacity (Amp-Hours)
	9.60	+	1.550	=	11.150

EXAMPLE



# Authority Having Jurisdiction (AHJ)

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## RESOURCE GUIDE

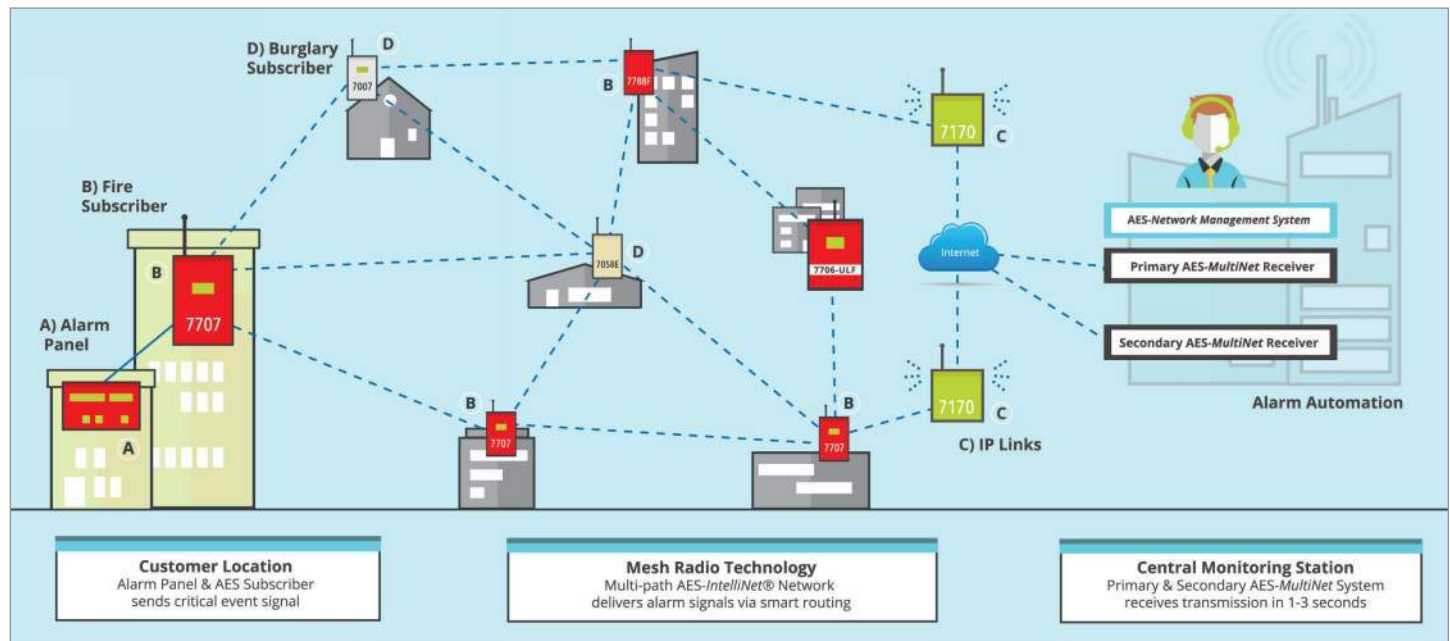
## Purpose

The purpose of this document is to provide the local Authority Having Jurisdiction (AHJ) information regarding AES-*IntelliNet*® patented mesh radio technology. The AES-*IntelliNet* product line is based upon Radio Frequency (RF) technology. RF is used for the transport of alarm communications in accordance with NFPA 72 compliance guidelines. This document can be used to thoroughly understand the implementation of AES products for use as a **One-Way Private Radio Alarm System** as prescribed by NFPA 72 National Fire Alarm and Signaling Code. The applicable references in the NFPA 72 Code handbook for AES Corporation can be found under:

- Year 2019 – 26.6.5.2/Technology Reference Comparison Table A.26.6.1
- Year 2016 – 26.6.5.2/Technology Reference Comparison Table A.26.6.1
- Year 2013 – 26.6.3.3.2/Technology Reference Comparison Table A.26.6.1
- Year 2010 – 26.6.3.3.2/Technology Reference Comparison Table A.26.6.1
- Year 2007 – 8.6.3.5/Technology Reference Comparison Table A.8.6.1
- Year 2002 – 8.5.3.5/Technology Reference Comparison Table A.8.5.1

## AES-*IntelliNet* Multi-Path Private Wireless Mesh Network

AES-*IntelliNet* is a private wireless mesh radio network made up of Subscriber units each acting as a receiver, transmitter, and repeater. Each protected premise outfitted with an AES Subscriber unit is linked to the AES-*IntelliNet* network by this Subscriber unit. The network allows distant Subscriber units to use one of many other Subscriber units to relay the alarm message to the network receiver hub. Signals follow the shortest route of all the available path options at that particular moment, ensuring the fastest and most reliable alarm communications possible. An explanation of some of the technical terms commonly used is provided below.





## Technical Terms

### Account ID

Also referred to as the Unit ID, this is a unique four character hexadecimal code used as the identifier for Subscriber units and IP Links. When communications take place on the network, the Account ID is used to identify the unit that is communicating.

### Cipher Code

This is a unique four character hexadecimal code used by all Subscriber units and IP Links on a network. The Cipher Code is similar to a password or key for a network. The Cipher Code protects communications that take place over the network. Each Subscriber unit must be programmed with a Unit ID (Account Number) AND a Cipher Code in order to communicate on the network. Once programmed, the Cipher Code cannot be viewed from the Handheld Programmer; it will always appear as X's. This is done to protect the Cipher Code from illegitimate use.

### AES-IntelliNet Network

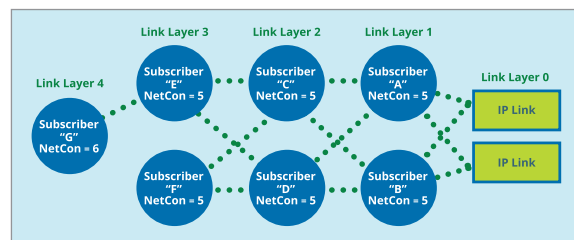
The AES-IntelliNet Network is a wireless mesh radio network, defined as a Radio Alarm System (RAS) in NFPA 72 2016 3.3.222. The mesh technology is self-healing and fault-tolerant providing no less than two transmission paths for Alarm, Supervisory, and Trouble signals from the protected premise to the supervising station.

### IP Link

AES IP Links are also known as a Radio Alarm Repeater Station Receiver (RARSR), as defined in NFPA 72 3.3.220. IP Links receive Alarm, Supervisory, and Trouble signals from the mesh network and relay those signals via TCP/IP connections to the supervising station. Phone line connectivity as an optional secondary means of communications is also supported within the IP Link. Note, this is not required by NFPA or UL. To accomplish this, an active Plain Old Telephone Service (POTS) line may be connected to the Tip and Ring terminal block on the main board of the IP Link. IP Links are assigned Link Layer values of 0, as they are the termination point for RF transmissions. IP Links are also assigned a Network Connectivity (NetCon) value of 0 for the same reason. Descriptions of Link Layer and NetCon follow below.

### Link Layer

The Link Layer defines the number of communication hops a Subscriber unit will take to reach an IP Link. A Link Layer of 2 indicates that there is one Subscriber unit between the reporting Subscriber unit and the IP Link. IP Links are always assigned a Link Layer of 0, as they are the last hop in the RF transmission path. The figure below depicts the Link Layer relationship:



### AES-MultiNet Receiver (MNR)

AES-MultiNet Receivers are also known as a Radio Alarm Supervising Station Receiver (RASSR) as defined in NFPA 72 2016 3.3.221. AES-MultiNet Receivers are installed in pairs (Primary and Secondary) to ensure redundancy in the event of a primary failure, satisfying the requirement of NFPA 72 2016 26.6.5.2.6(B) compliance.

### Network Connectivity (NetCon)

Network Connectivity, commonly referred to as NetCon, is a unique algorithm developed by AES Corporation as a measure of transmission paths within a mesh radio network. NetCon calculations include evaluation of signal quality and Link Layer to derive a NetCon value. As described later in this document, a NetCon value of 5 indicates 2 or more viable transmission paths thus satisfying the requirement of NFPA 72 2016 26.6.5.2.1(B) compliance. The viable transmission paths may be viewed in the Routing Table.

### Radio Frequency (RF)

The transmission medium used by the mesh radio network for the transmission of signals and data is often referred to as RF. AES-IntelliNet networks operate on federally licensed, protected, and regulated spectrum within the 450 MHz and 470 MHz bands. Network owners and operators (alarm dealers, installers, or Central Monitoring Stations) are required to obtain a Federal Communications Commission (FCC) license for operation on their own assigned frequency prior to bringing a network into service. Detailed information on the licensing process is available at [https://en.wikipedia.org/wiki/Broadcast\\_license](https://en.wikipedia.org/wiki/Broadcast_license).

## Radio/Transceiver

The silver box mounted within AES Subscriber units and IP Link units is also known as the transceiver. It receives and transmits RF messages exchanged between Subscriber units and IP Links. Subscriber units are also sometimes referred to as radios.

## Subscriber Unit

Subscriber units are a Radio Alarm Transmitter (RAT) as defined in NFPA 72 2016 Code 3.3.223. They may also serve as a Radio Alarm Repeater Station Receiver (RARSR) as defined in NFPA 72 3.3.220. The Subscriber unit is the final unit assembly consisting of an antenna, various electronic boards and components, and the transceiver. Subscriber units are sometimes referred to as radios, but it's important to note that they are technically the transceiver.

## Routing Table

The Routing Table is a record of viable transmission paths a Subscriber unit has available to it. A Routing Table itself may contain up to a maximum of 8 viable transmission paths, although the Subscriber unit may have many more than 8 transmissions paths available. These paths, or routes, are what a Subscriber unit will use when transmitting an Alarm, Supervisory, or Trouble signal to the supervising station. The Routing Table is dynamic. As conditions change, the table is modified and other paths are entered into the list. For example, when other Subscriber units encounter troubles or as the RF climate changes, the best path is always listed first.

A good path consists of the following elements:

- The repeating Subscriber unit is at the same Link Layer or lower than that of the reporting Subscriber unit.
- The repeating Subscriber unit has a NetCon value of 5 or 6.
- The signal quality (Q) level is 02 or 03.

The following are samples of routing tables:

```
4.5678,L=01,N=5,Q=03
3.7888,L=01,N=5,Q=03
2.BB12,L=00,N=0,Q=03
1.AA11,L=00,N=0,Q=03
```

```
1 9797 L:00 N:0 Q: Good (03)
2 9898 L:00 N:0 Q: Good (03)
3 7777 L:01 N:5 Q: Good (03)
4 EEEE L:01 N:5 Q: Good (02)
```

```
5 6666 L:01 N:5 Q: Good (03)
6 8888 L:01 N:5 Q: Good (03)
7 4444 L:01 N:5 Q: Good (03)
8 EEE1 L:01 N:5 Q: Good (03)
```

The routing table is read from the bottom to the top. Route 1 is the best possible route. The table is decoded as follows:

**1** - Indicates routing table path # 1.

**9797** - Account ID of the first Subscriber unit/IP Link in the pathway of the reporting Subscriber unit.

**L:00** - A Link Layer of 0, this indicates that the reporting unit is to an IP Link. There are 0 hops from the reporting unit to the IP Link.

**N:0** - Indicates the NetCon value unit the reporting Subscriber unit is transmitting to. IP Links are always a NetCon 0.

**Q: Good (03)** - This path has good signal quality.

## Signal Quality

Signal Quality (Q Value) level is a measure of the RF signal. This measurement is used to evaluate the viability of communications between Subscriber units. The table below defines the signal quality values:

Q Value	Definition
01	Good RF signal strength, not heard in over 4 hours.
02	Good RF signal strength, not heard in over 2 hours.
03	Good RF signal strength, not heard recently.
81	Very weak RF signal, not heard in over 4 hours
82	Carrier detection failure or weak RF signal, not heard in over 2 hours
83	Carrier detection failure or weak RF signal, not heard recently

## Installation Recommendations

### AES Recommended Best Practices

The following items are AES Corporation recommended Best Practices. By following these recommendations, installers will have met AES installation standards.

The AES-*IntelliNet* Network will ideally be built in expanding concentric rings, with the IP Links being at the center and the Subscriber units surrounding the IP Links. The following diagram depicts a well implemented AES-*IntelliNet* Network. In the center of the diagram, the green push pins represent the IP Links. Please note how they are positioned in the center of the rings. The red push pins represent Fire Subscriber units and the yellow push pins represent Burglary Subscriber units. The rings represent the concentric manner in which AES recommends the network be established. The green ring represents a three mile radius, this is followed by the yellow ring encompassing a six mile radius, and finally the red ring representing a nine mile radius. A network should be built within the three mile ring first, then expand to the six and nine mile rings, and grow incrementally from there. It is important to note that this diagram is only an example for reference. Actual ring radii are dependent upon geography, landscape, infrastructure, and antenna types. With those considerations taken into account, the rings may be as large as 10 miles and as small as one mile.

For an initial network build out, a minimum of 2 IP Links are required. The IP Links should be installed no more than 2 miles apart. The external antennas should be physically separated by at least twenty feet (20') horizontally.



The following bulleted items apply to both IP Links and Subscriber units:

- External antenna is mounted at least 18 inches above the roof line.
- External antenna is at least 10 inches away from any parapet, wall, or obstruction.
- External antenna should have 360 degree visibility.
- All antennas must be plumb when mounted.
- External antennas must have a lightning protector installed (preferably as close to the antenna as possible).
- RG-58 cabling is no longer than twenty-five feet (25').
- RG-8 cabling is no longer seventy-five feet (75').
- LMR-400 (LMR-600 preferred) cabling is no longer than one-hundred twenty-five feet (125').
- Service Length: A little extra coax is reasonable and desirable to allow for servicing the devices attached. Typically no more than an additional 12 inches or so should be necessary. This is needed to allow movement of the cable to enable such things as connectors to be disconnected and antenna to be installed and removed for service.
- No Tight Bends: Coaxial cable does not tolerate being bent in a tight radius. Much as a solid pipe, the structure of the coax can kink if bent too much. As the cable is bent, the center conductor has the tendency to be pushed or driven toward the shield on the outside and away on the inside. Coax derives some of its characteristics from the distance between the center conductor and its shield. Tight bends can negatively affect those characteristics. Tight bending can permanently alter the coax such that it can never be corrected.

6 inch radius is the minimum recommended for the AES supplied RG-8 Coax.

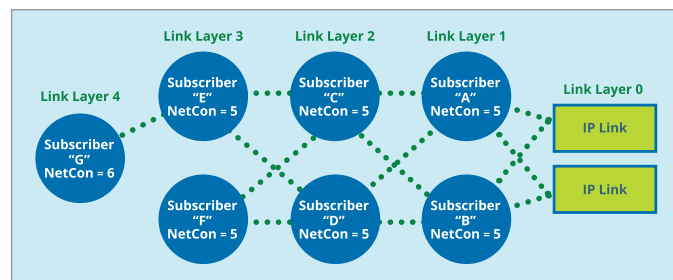
## Technical Overview

### Link Layer & NetCon Defined

AES Corporation utilizes a concept known as Network Connectivity (NetCon) to assess available transmission paths to Subscriber units on a network. There are three possible NetCon values that can be achieved by a Subscriber unit (see table below):

NetCon Value	Definition
7	1 weak transmission path or no available transmission paths.
6	At least 1 viable transmission path.
5	At least 2 viable transmission paths.

A NetCon value of 5 is validation that the Subscriber unit has at least two viable transmission paths as required by NFPA 72 2016 Section 26.6.5.2.1(B). The algorithm for NetCon calculation is complex and involves measures of RF signal quality as well as Link Layer (position of a communication path relative to an available IP Link). Below is a graphical representation of mesh radio network and NetCon values for Subscriber units within that network:



In the graphic above, you can see that the IP Link is a Link Layer of 0. This will always be the Link Layer value for an IP Link. Subscriber Unit A has a Link Layer of 1 as it is 1 'hop' from the IP Link. Subscriber Unit C is a Link Layer of 2 because it is 2 'hops' away from an IP Link. This logic continues down the chain.

Focusing on Subscriber Unit G, you will note it has a NetCon of 6 as it only has 1 forward route to the IP Link. This assumes that Subscriber Unit G cannot recognize or communicate with Subscriber Unit F. Subscriber Unit E has a NetCon level of 5 because it has two communication paths, one via Subscriber Unit C and another via Subscriber Unit D. The Link Layer of Subscriber Unit G is denoted as 4 as it requires 4 'hops' to reach the IP Link.

Subscriber units poll the mesh radio network to build Routing Tables. These Routing Tables establish the best possible route for transmissions and consists of up to 8 available routes.

When a Subscriber unit has a packet to transmit, it will reference its Routing Table and selects the route at the top of the list – this is position one (the best possible route). It then transmits the packet to that route and waits for a packet acknowledgment to be returned from that route. If it is not received, in 5 to 15 seconds, the transmission is repeated to the same route. It is repeated until it has been tried seven times. After seven attempts, the failed route is removed from the list. The list is then re-sorted and transmission continues with the new route in the number one position. This continues until the packet acknowledgment is received or the table is empty. This logic is the heart of the mesh radio network's self-healing properties.

When a Subscriber unit encounters a NetCon value of 6 or 7, it is reported to the supervising station during the Subscriber unit's daily Check-In. As described in the earlier table, a NetCon value of 7 could mean there are no available communication paths. If that is the case, then the affected Subscriber unit would have a missed Check-In – this too is reported to the supervising station.



### NetCon Testing

Due to the self-healing properties of the mesh radio network, it is difficult to reproduce NetCon failures within a network. This is acknowledged in NFPA 72 2016 A.26.6.5.2 which reads in part, "...It is difficult to reliably test redundant paths on a mesh radio network without significant impact on the system and considerable efforts of time and personnel..."

Testing NetCon failures can be conducted, however there is risk to the protected premises. In the extreme case where a failure is requested in order to validate system functionality, the Subscriber unit must be taken offline.

#### 7707 Fire Subscriber Unit & 7177 Hybrid 2.0 Subscriber Unit

To test a NetCon failure, begin by pressing the Menu button on the front of the unit. Press the button until you reach the screen that displays Link Layer and NetCon. Alternatively you can identify the NetCon by accessing the programming interface (see Installation and Operation Manual) and navigating to the Status section. Under normal conditions the unit will report as follows:

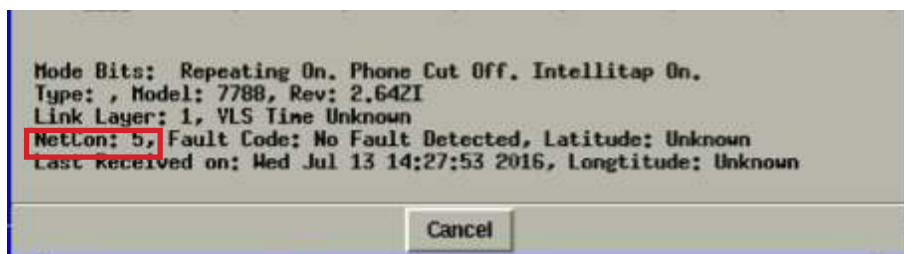


Once you have verified the NetCon value and the Routing Table, disconnect the 9 pin serial connection to the AES radio transceiver (this test is equivalent to the Subscriber unit being offline). Depending on the size of the Routing Table, it may take up to 10 minutes for all routes to be tried and discounted as not valid. After 10 minutes, press the Menu button on the front of the unit until you reach the screen that displays Link Layer and NetCon. A NetCon failure will report as follows:



#### 7788F Fire Subscriber Unit

To test a NetCon failure, begin by connecting the AES Handheld Programmer to the Subscriber unit. Next, press and hold the Shift key and the F4 key (Shift+F4) or d on the PC keyboard. This will provide a value for the current NetCon. Next, to display the Subscriber unit's current routing table, press just F4 key (or Ctrl+T on PC keyboard). Once you have verified the NetCon value and the Routing Table, disconnect the 9 pin serial connection to the AES radio transceiver (this test is equivalent to the Subscriber unit being offline). Depending on the size of the Routing Table, it may take up to 10 minutes for all routes to be tried and discounted as not valid. After 10 minutes, press Shift+F4 and a NetCon of 7 will be displayed. Next press F4 and you will see a message indicated 'Not on Network', which means there are no available routes for communication. It is possible to remotely retrieve a Subscriber unit's NetCon value at the supervising station. Trained personnel will perform a "get status" on the Subscriber unit. They will be presented with the following screen:



### 7706-ULF Integrated Fire Panel

Testing of NetCon failures can be accomplished by changing the units cipher code (see the Installation, Operation & Programming Manual) and allowing the unit to reset. After the unit has re-initialized (~3 to 5 minutes) the unit will annunciate and display "Trb-AES Comm AES PIC Trouble [1]". This identifies that the unit has lost RF communications (no viable transmission paths). By viewing the PIC status (see the Installation, Operation & Programming Manual) you can confirm the units NetCon value of 7. When testing is complete, be sure to reset the cipher code to its original value.

### RF Communication Failures

NFPA 72 2016 10.14.1 requires annunciation at the protected premise within 200 seconds of an RF communications failure (trouble condition).

### 7707 Fire Subscriber Unit\* & 7177 Hybrid 2.0 Subscriber Unit

The annunciation of an RF communications failure can be facilitated by one of the following methods:

- **The onboard integrated annunciator. Or,**
- **If the FACP is equipped with AUX power, the power can be connected to an AES 7740 module. The AUX power common is then connected to the J4 output of the AES Subscriber unit. This will activate the 7740 annunciator. Or,**
- **Remote 7740 to J5 of the 7707.**

### 7788F Fire Subscriber Unit\*

The annunciation of an RF communications failure can be facilitated by one of the following methods:

- **The J4 output of the AES Subscriber unit is connected to the point or zone on the FACP when a FACP equipped with an annunciator is enabled for local annunciation. Or,**
- **If the FACP is equipped with AUX power, the power can be connected to an AES 7740 module. The AUX power common is then connected to the J4 output of the AES Subscriber unit. This will activate the 7740 annunciator. Or,**
- **Using a 7762 module combined with a 7740 will offer local annunciation using power from the AES Subscriber unit. Or,**
- **Using a 7795 kit (7794 + 7762 + 7740) the AES Subscriber unit will offer primary communications with local annunciation.**

*\*The J4 output of the Subscriber unit should never be wired back into a reporting zone of the FACP. Doing so will result in a 'looping' effect that may have a harmful impact upon the mesh network. See Technical Note #003.*

Testing of RF communication failures with local annunciation can be accomplished by disconnecting the 9 pin serial connection to the AES radio transceiver. This test is equivalent to the AES Subscriber unit being offline (there is no RF communication when the transceiver is disconnected). This is similar to pulling a phone line. There is no need to power down the Subscriber unit when performing this test – the transceiver is not in danger of being damaged as the 9 pin serial connector is the power source for the transceiver. Local annunciation will occur within 200 seconds if the RF communications is not restored.

### 7706-ULF Integrated Fire Monitoring System

The built-in local annunciator will satisfy the requirement of NFPA 72 2016 10.14.1. Testing of RF communication failures with local annunciation can be accomplished by changing the unit's Cipher Code and allowing the unit to reset. For detailed instructions, please refer to the product Installation, Operation & Programming Manual. After the unit has re-initialized (~3 to 5 minutes), the unit will annunciate and display "Trb-AES Comm AES PIC Trouble [1]". This identifies that the unit has lost RF communications. When testing is complete, be sure to reset the Cipher Code to its original value.

Supervising station notification of RF communication failures occurs every 24 hours via a self-test function (NFPA 72 2016 Table A.26.6.1) – this is similar to a phone line timer test. RF communications can be verified via automation reports detailing successful self-test completions (CID E602). Automation will provide notification when expected self-tests are missed (i.e., RF communication failures). The steps to reproduce an RF communications failure are similar to the steps mentioned above in the NetCon section and carry the same level of risk to the protected premise.

## Battery Requirements

### 7707 Fire Subscriber Unit

The following table details AES battery recommendations for the 7707 Fire Subscriber unit, along with the accompanying add-on accessory boards. The requirement of NFPA 72 2016 10.6.7.2.1 will be satisfied when using these recommendations and when the batteries are properly maintained and serviced.

System Configuration Description	Battery Size
7707, 7711 (8 zone input card)	10 Ah
7707, 7712 (8 zone input card - 4 ea. EOL and 4 ea. reverse polarity)	10 Ah
7707, 7794A (IntelliPro Fire Module), 7711 (8 zone input card)	12 Ah
7707, 7794A (IntelliPro Fire Module), 7712 (8 zone input card - 4 ea. EOL and 4 ea. reverse polarity)	12 Ah
7707, 7794A (IntelliPro Fire Module)	12Ah

The following are the current draw specifications per the related AES installation and operation manuals.

- **7707 – 175mA standby, 1.2A transmit**
- **7707 – 200mA standby + charging backup battery**
- **7707 – 1.2 A transmit (alarm) (typical transmission is 1/3 second length)**
- **7794 – 200mA standby/transmit (alarm)**

### 7788F Fire Subscriber Unit

The following table details AES battery recommendations for fire Subscriber units, along with the accompanying add-on accessory boards. The requirement of NFPA 72 2016 10.6.7.2.1 will be satisfied when using these recommendations and when the batteries are properly maintained and serviced.

Description	Current	Battery Size Required
7788F	See 7788F Installation and Operation Manual.	7.5 Ah
7788F + 7794	See 7788F & 7794 Installation and Operation Manuals.	7.5 Ah
7788F + 7794 + 7762 + 7740	See 7788F, 7794 & 7762 Installation and Operation Manuals. For 7740 refer to Sec. 3.5 - Fig. 4A and Fig. 4B in this manual.	12 Ah
7788F + 7762 + 7740	See 7788F & 7762 Installation and Operation Manuals. For 7740 refer to Sec. 3.5 - Fig. 4A and Fig. 4B in this manual.	12 Ah

The following are the current draw specifications per the related AES installation and operation manuals.

- **7788F: 150mA standby, 1.2A transmit (alarm)**
- **7794: 200mA standby/transmit (alarm)**
- **7762: 30mA standby/trouble (alarm)**
- **7740: 37mA standby, 65mA trouble (alarm)**

### 7170 Remote IP Link Receiver

An IP Link requires a 12v 10Ah battery as a secondary power source to ensure 24-hour operation in the event of a primary power loss. The requirement of NFPA 72 2016 10.6.7.2.1 will be satisfied when using a battery of this size and when the battery is properly maintained and serviced. The IP Link has a current draw of 370mA standby and 900mA transmit (alarm).

## Battery Requirements

### 7177 Hybrid 2.0 Fire Subscriber

The battery size requirement for all 7177 Hybrid configurations is a 12Ah battery which satisfies the requirement for 24 hour backup.

### 7706-ULF Integrated Fire Monitoring System

Before selecting the battery, it is important to determine the minimum size batteries for standby and alarm times desired for each application. If the wrong batteries are installed in a specific application or incorrect current draw is used, the proper standby and minimum alarm time will not be present.

The battery circuit is rated for 8 to 18 AH batteries and will operate the panel alarm for at least 24 hours and 5 minutes. The cabinet will house up to two (2) 8 AH or two (2) 18 AH batteries.

Please use the worksheet on AES Corporation's official website to calculate the battery size and current draw required for each application:  
<http://aes-corp.com/wp-content/uploads/2015/10/7706-Battery-Calculator.xls>

The following are the current draw specifications for the 7706-ULF per the related AES installation and operation manuals.

- **Mainboard (PFC-6006): 105mA standby, 160mA transmit (alarm)**
- **Subscriber unit (7788F, 7764, & 7085UE5): 200mA standby/transmit (alarm)**
- **LCD Remote RA-6075: 20mA standby, 25mA transmit (alarm)**

NFPA 72 2019 Table A.26.6.1

Criteria	One-Way Private Radio Alarm Systems 26.6.5.2	Performance Based Technologies 26.6.3
FCC Approval when applicable.	Yes.	Yes.
Conform to NFPA 70.	Yes.	Yes.
Monitoring for integrity of the transmission and communications channel.	Test signal from every transmitter once every 24 hours.	Monitor for integrity.
Annunciate, at the supervising station, the degradation and restoration of transmission or communications channel.	Only monitor the quality of signal received and indicate if the signal falls below minimum signal quality specified in Code.	Within 60 minutes for a path and within 6 hours for multiple communication paths.
Redundant communication path where a portion of the transmission or communications channel cannot be monitored for integrity.	Minimum of two independent RF paths must be simultaneously employed.	
Interval testing of the backup path(s).	No requirement, because the quality is continuously monitored.	
Annunciation of communications failure or the ability to communicate to the protected premise.	Monitor the interconnection of the premise unit elements of transmitting equipment, and indicate a failure at the premise or transmit a trouble signal to the supervising station.	Systems where the transmitter at the local premises unit detects a communication failure, the premises unit will annunciate the failure within 200 seconds of the failure.
Time to restore signal-receiving, processing, display, and recording equipment.	Where duplicate equipment not provided, spare hardware required so a repair can be effected within 30 minutes.	Where duplicate equipment not provided, spare hardware required so a repair can be effected within 30 minutes.
Loading capacities for system units and transmission and communications channels.	512 buildings and premises on a system unit with no backup. Unlimited if you can switch to a backup in 30 seconds.	512 independent alarm systems on a system unit with no backup. Unlimited if you can switch to backup in 30 seconds.

NFPA 72 2019 Table A.26.6.1 (Continued)

Criteria	One-Way Private Radio Alarm Systems 26.6.5.2	Performance Based Technologies 26.6.3
End-to-end communication time for an alarm.	90% probability to receive an alarm in 90 seconds, 99% probability in 180 second, 99.999% probability in 450 seconds.	90 seconds from the initiation of alarm until displayed to the operator and recorded on a medium from which the information can be retrieved.
Record and display rate of subsequent alarms at supervising station.	When any number of subsequent alarms come in, record at a rate not slower than one every additional 10 seconds.	Not slower than one every 10 additional seconds.
Signal error detection and correction.	Not addressed.	Signal repetition, parity check, or some equivalent means of error detection and correction must be used.
Path sequence priority.	Not addressed.	No need for prioritization of paths. The requirement is that both paths are equivalent.
Carrier diversity.	Not addressed.	
Throughput probability.	90% probability to receive an alarm in 90 seconds, 99% probability in 180 second, 99.999% probability in 450 seconds.	
Unique premises identifier.	Yes.	If a transmitter shares a transmission or communication channel with other transmitters, it must have a unique transmitter identifier.
Unique flaws.	None addressed.	From time to time, there may be unique flaws in a communication system. Unique requirements must be written for these unique flaws.
Signal priority.	Chapter 1 fundamentals requires that alarm signals take priority over supervisory signals unless there is sufficient repetition of the alarm signal to prevent the loss of an alarm signal.	If the communication methodology is shared with any other usage, all alarm transmissions must preempt and take precedence over any other usage. Alarm signals take precedence over supervisory signals.
Sharing communications equipment on premises.	Not addressed.	If the transmitter is sharing on-premises communications equipment, the shared equipment must be listed for the purpose (otherwise the transmitter must be installed ahead of the unlisted equipment).



## Field Inspection Checklist (RF Communications)

Test	Description	Applicable Product	NFPA 72 2016	Result (Pass/Fail)	Image/ Example	Test Instructions
Is the unit connected to a circuit that is dedicated to the fire alarm system only?	NFPA requires the primary power supply be under 'no other load'.	All	10.6.5.1.2			Visually inspect.
Is the AC/DC transformer mounted within an approved enclosure?	Required for UL compliance when not connected to a UPS.	All				Visually inspect.
Is the AC/DC transformer securely fastened with a screw?	Required for UL compliance when not connected to a UPS.	All				Visually inspect.
Is the proper battery in place?	NFPA requirements for power supply capacity.	All	10.6.7.2			Visually inspect, review battery calculations.
If an external antenna is in use, is a lightning protector connected and run to ground?	NFPA requires external antennas be protected to minimize damage from static discharge and lightning.	All	26.6.2.3.2			Visually inspect.
Does the Subscriber unit have a NetCon value of 5?	NFPA requires a minimum of 2 transmission paths.	7788F 7707 7177	26.6.5.2.1(B)		 	7788F: Connect the AES handheld programmer and press Shift+F4 – this will provide a value for the current NetCon. 7707: Press the Menu button on the front of the unit until the Link Layer and NetCon screen is displayed. Verify the NetCon reading is a 5. This information may also be viewed via the graphical user interface.
Does the routing table contain at least 2 transmission paths?	NFPA requires a minimum of 2 transmission paths.	7788F 7707 7177	26.6.5.2.1(B)		 	7788F: Connect the AES handheld programmer and press F4 - this will detail the Subscriber unit's current routing table. 7707: Press the Menu button on the front of the unit until the Routing Table is displayed. This information may also be viewed via the graphical user interface.
Successfully complete an antenna cut test (RF Failure).	NFPA requires reporting RF failure and antenna supervision.	7707 7177	26.6.5.2.3(A) & (B)		   	<p>To test an antenna cut, begin by pressing the Menu button on the front of the unit. Press the button until you reach the screen that displays Link Layer &amp; NetCon. Alternatively you can identify the NetCon by accessing the programming interface (see Installation &amp; Operation Manual) &amp; navigating to the Status section.</p> <p>Once you have verified the NetCon value and the Routing Table, disconnect the 9 pin serial connection to the AES radio transceiver (this test is equivalent to the Subscriber unit being offline). Depending on the size of the Routing Table, it may take up to 10 minutes for all routes to be tried and discounted as not valid. After 10 minutes, press the Menu button on the front of the unit until you reach the screen that displays Link Layer &amp; NetCon.</p>

## Field Inspection Checklist (RF Communications) (Continued)

Test	Description	Applicable Product	NFPA 72 2016	Result (Pass/Fail)	Image/ Example	Test Instructions
Successfully complete an antenna cut test (RF Failure)	NFPA requires reporting RF failure and antenna supervision.	7788F	26.6.5.2.3(A) & (B)			To test an antenna cut, begin by disconnecting the 9 pin serial connection to the AES radio transceiver (this test is equivalent to the Subscriber unit being offline), connect the AES handheld programmer and press Shift+F4 – this will provide a value for the current NetCon. Next, press F4 – this will detail the Subscriber unit's current routing table. Depending on the size of the routing table it may take up to 10 minutes for all routes to be tried and discounted as not valid. After 10 minutes, press Shift+F4 and a NetCon of 7 will be displayed. Next press F4 and you will see a message indicated 'Not on Network', which means there are no available routes for communication.
Does the panel unit have a NetCon value of 5?	NFPA requires a minimum of 2 transmission paths.	7706-ULF	26.6.5.2.1(B)			Using the keypad, press 5 then enter. Enter the code of 1111 then enter. Press 8 then enter. Press 1 to view status where the NetCon value will be displayed.
Does the routing table contain at least 2 transmission paths?	NFPA requires a minimum of 2 transmission paths.	7706-ULF	26.6.5.2.1(B)			Using the keypad, press 5 then enter. Enter the code of 1111 then enter. Press 8 then enter. Press 2 to view the available routes. Use the arrow keys to scroll.
Successfully complete an antenna cut test (RF Failure)	NFPA requires reporting RF failure and antenna supervision.	7706-ULF	26.6.5.2.3(A) & (B)			To test an antenna cut, follow the steps detailed in the 7706-ULF Installation, Operation & Programming Manual for changing the Cipher Code and reviewing the Routing Table.
Reporting of Alarm, Supervisory, and Trouble signals.	NFPA requires reporting of Alarm, Supervisory, and Trouble signals.	All	10.8 to 10.11, 10.13 to 10.14, 10.17, 26.2.1.2, 26.2.1.3, 26.2.3, 26.2.4			Trip the related zones on the FACP, verify receipt of signals at the supervising station.
Reporting of AC failure	NFPA requires reporting for the loss of AC power.	All	26.6.5.2.3(A)			Disconnect AC power from the Subscriber unit. Reporting will occur within 100 to 160 minutes per NFPA.



## Field Inspection Checklist (IP Communications)

Test	Description	Applicable Product	NFPA 72 2016	Result (Pass/Fail)	Image/ Example	Test Instructions
Reporting of Alarm, Supervisory, and Trouble signals	NFPA requires reporting of Alarm, Supervisory, and Trouble signals.	7707 7177	10.8 to 10.11, 10.13 to 10.14, 10.17, 26.2.1.2, 26.2.1.3, 26.2.3, 26.2.4			Trip the related zones on the FACP, verify receipt of signals at the supervising station.
Reporting of AC failure	NFPA requires reporting for the loss of AC power.	7707 7177	26.6.5.2.3(A)			Disconnect AC power from the Subscriber unit. Reporting will occur within 100 to 160 minutes per NFPA.
Annunciate, at the supervising station, the degradation and restoration of transmission or communications channel	NFPA requires the loss of a signal path be annunciated within 60 minutes.	7707 7177	26.6.3.2 26.6.3.3			Disconnect the IP connection from the unit. Verify the Central Station receives notification if a missed check-in from the Account ID associated with the unit.
Annunciation of communications failure or the ability to communicate to the protected premise	NFPA requires communications failures be annunciated at the protected premise within 200 seconds.	7707 7177	A.26.6.1			Disconnect the IP connection from the unit. Verify the local annunciator sounds within 200 seconds.
90 second alarm reporting time	NFPA requires alarms be communicated to the supervising station within 90 seconds of initiation.	7707 7177	26.6.3.8			Trip the related zones on the FACP, verify receipt of signals at the supervising station within 90 seconds.
Is the proper battery in place?	NFPA requirements for power supply capacity.	7707 7177	10.6.7.2 26.6.3.13			Visually inspect, review battery calculations.

## NFPA 72 2019 Code Conformance

Code Section	Requirement Satisfied
10.6 Power Supplies	Installers are responsible for adhering to this section of code to ensure the requirements are satisfied.
10.6.7.1 Secondary Power Operation	When properly sized batteries are installed, the performance of the system will not be affected when operating on secondary power.
10.6.7.2 Capacity	When installed in accordance to the AES installation manual, AES fire products conform to and satisfy the capacity requirements for secondary power supplies as specified in this code section.
10.6.9.1.1 Failure of either the primary or secondary power supply shall result in a trouble signal in accordance with Section 10.14	Power supplies (primary and secondary) are supervised within the AES products.
10.8 Detection and Signaling of Conditions	AES fire products satisfy the applicable requirements of this section.
10.9 Responses	AES fire products satisfy the applicable requirements of this section.
10.10 Distinctive Signals	AES fire products satisfy the applicable requirements of this section.
10.11 Alarm Signals	AES fire products satisfy the applicable requirements of this section.
10.13 Supervisory Signals	AES fire products satisfy the applicable requirements of this section.
10.14 Trouble Signals	AES fire products satisfy the applicable requirements of this section.
10.17 Annunciation and Annunciation Zoning	AES fire products satisfy the applicable requirements of this section.
26.2.3 Alarm Signal Content	AES fire products satisfy the applicable requirements of this section.
26.2.4 Restoral Signals	AES fire products satisfy the applicable requirements of this section.
Table 26.6.1 Communications Methods for Supervising Stations	AES fire products satisfy the requirements associated with One-Way Private Radio Alarms Systems as detailed in the table.
26.6.2.3.1(1) & (2) Alarm system equipment and installations shall comply with the Federal Communications Commission (FCC) rules and regulations, as applicable, concerning the following: (1) Electromagnetic radiation and (2) Use of radio frequencies	AES fire products comply with this section, radio equipment is certified with the FCC.
26.6.2.3.2 Equipment shall be installed in compliance with NFPA 70	Installers are responsible for adhering to this section of code to ensure the requirements are satisfied.
26.6.2.3.3 The external antennas of all radio transmitting and receiving equipment shall be protected in order to minimize the possibility of damage by static discharge or lightning	Installers are responsible for adhering to this section of code to ensure the requirements are satisfied.
26.6.5.2 One-Way Private Radio Alarm Systems	AES fire products satisfy the requirements of this section.
26.6.3 Performance-Based Technologies	The AES 7707 Fire Subscriber satisfies the requirements of this section.

### About AES Corporation

AES Corporation is the leading manufacturer of code compliant wireless alarm communication products and solutions serving commercial security markets and government agencies worldwide. **AES-IntelliNet®** patented technology will never sunset compared to obsoleting technologies such as cellular and traditional phone lines. AES private mesh radio networks are owner operated and controlled, providing infinite scalability and superior reliability with the fastest transmission speed available. Over a half million AES Smart Subscribers are installed worldwide. AES is the clear choice for life safety and security, protecting people and property for over 40 years. For more information, please visit [www.aes-corp.com](http://www.aes-corp.com).

Contact us at **(800) 237-6387** | [info@aes-corp.com](mailto:info@aes-corp.com)

Building	Address	Shop Drawings Submitted to TLH Fire for Review	Shop Drawings Submitted for Permit	AES Transmitter Transfer	Antenna Relocation / Replacement (if required)	AHJ Approved Antenna Type and Location	Migration to new monitoring company	100% Fire Alarm Testing (if alternate is accepted)	AHJ Final
Perinatal Facility	13243 East 23rd Ave.								
Academic Office (AO1) at Fitzsimons	12631 East 17th Ave.								
Research I South	12801 East 17th Ave.								
School of Dental Medicine	13065 East 17th Ave.								
Education II South	13120 East 17th Ave.								
Barbara Davis Center For Childhood Diabetes	1775 Aurora Court								
Nighthorse Campbell Native Health Building	13055 East 17th Ave.								
Anschutz Health & Science Building	1890 North Revere Ct.								
Research Complex 2	12700 East 19th Ave.								
Research I North	12800 East 19th Ave.								
Education I	13070 East 19th Ave.								
Education II North	13120 East 19th Ave.								
Pascal II	13188 East 19th Ave.								
Campus Safety & Emergency Preparedness	13309 East 17th Place								
Building B400	12469 East 17th Place								
Fitzsimons Building	13001 East 17th Place								
Building B401	1784 Racine Street								
Fulginiti Pavilion	13080 19th Ave.								
EH&S Environmental Health & Safety	13178 East 19th Ave.								
Building B402	12474 East 19th Ave.								
Central Utility Plant	13350 East 19th Ave.								
Building B406	12477 East 19th Ave.								
Campus Services Building	1945 North Wheeling St.								
Building B407	12454 East 19th Ave.								
V07 House	1954 Quentin St.								
Health & Wellness Center	12348 East Montview Blvd.								
Henderson Parking Garage	12706 East Mount view Blvd.								
Building V20 - UCD Pharmacy	12850 East Montview								
Strauss Fitzsimons Library	12950 East Montview								



Building/Location Name	Building Number	Address	FACP Type
Perinatal Facility	AK32	13243 East 23rd Ave.	EST-3
Academic Office (AO1) at Fitzsimons	L15	12631 East 17th Ave.	EST-3
Research I South	L18	12801 East 17th Ave.	EST-3
School of Dental Medicine	L26	13065 East 17th Ave.	EST-3
Education II South	L28	13120 East 17th Ave.	EST-3
Barbara Davis Center For Childhood Diabetes	M20	1775 Aurora Court	EST-3
Nighthorse Campbell Native Health Building	M24	13055 East 17th Ave.	EST-3
Anschutz Health & Science Building	P12	1890 North Revere Ct.	EST-3
Research Complex 2	P15	12700 East 19th Ave.	EST-3
Research I North	P18	12800 East 19th Ave.	EST-3
Education I	P26	13070 East 19th Ave.	EST-3
Education II North	P28	13120 East 19th Ave.	EST-3
Pascal II	P30	13188 East 19th Ave.	EST-3
Campus Safety & Emergency Preparedness	P34	13309 East 17th Place	EST-3
Building B400	Q09	12469 East 17th Place	EST-3
Fitzsimons Building	Q20	13001 East 17th Place	EST-3
Building B401	R09	1784 Racine Street	EST-3
Fulginiti Pavilion	R27	13080 19th Ave.	EST-3
EH&S Environmental Health & Safety	R30/R31	13178 East 19th Ave.	EST-3
Building B402	S09	12474 East 19th Ave.	EST-3
Central Utility Plant	S34	13350 East 19th Ave.	EST-3
Building B406	T09	12477 East 19th Ave.	EST-3
Campus Services Building	T36	1945 North Wheeling St.	EST-3
Building B407	U09	12454 East 19th Ave.	EST-3
V07 House	V07	1954 Quentin St.	EST-3
Health & Wellness Center	V08	12348 East Montview Blvd.	EST-3
Henderson Parking Garage	V17	12706 East Mount view Blvd.	EST-3
Building V20 - UCD Pharmacy	V20	12850 East Montview	EST-3
Strauss Fitzsimons Library	V23	12950 East Montview	EST-3

Building	100% Fire Alarm Testing 2023	100% Fire Alarm Testing 2024	100% Fire Alarm Testing 2025	100% Fire Alarm Testing 2026	100% Fire Alarm Testing 2027	TOTALS
Perinatal Facility						0
Academic Office (AO1) at Fitzsimons						0
Research I South Building						0
School of Dental Medicine						0
Education II South						0
Barbara Davis Center For Childhood Diabetes						0
Nighthorse Campbell Native Health Building						0
Anschutz Health & Science Building						0
Research Complex 2						0
Research I North						0
Education I						0
Education II North						0
Pascal II						0
Campus Safety & Emergency Preparedness						0
Building B400						0
Fitzsimons Building						0
Building B401						0
Fulginiti Pavilion						0
EH&S Environmental Health & Safety						0
Building B402						0
Central Utility Plant						0
Building B406						0
Campus Service Building						0
Building B407						0
V07 House						0
Health & Wellness Center						0
Henderson Parking Garage						0
Building V20 - UCD Pharmacy						0
Strauss Fitzsimons Library						0
TOTALS	0	0	0	0	0	0